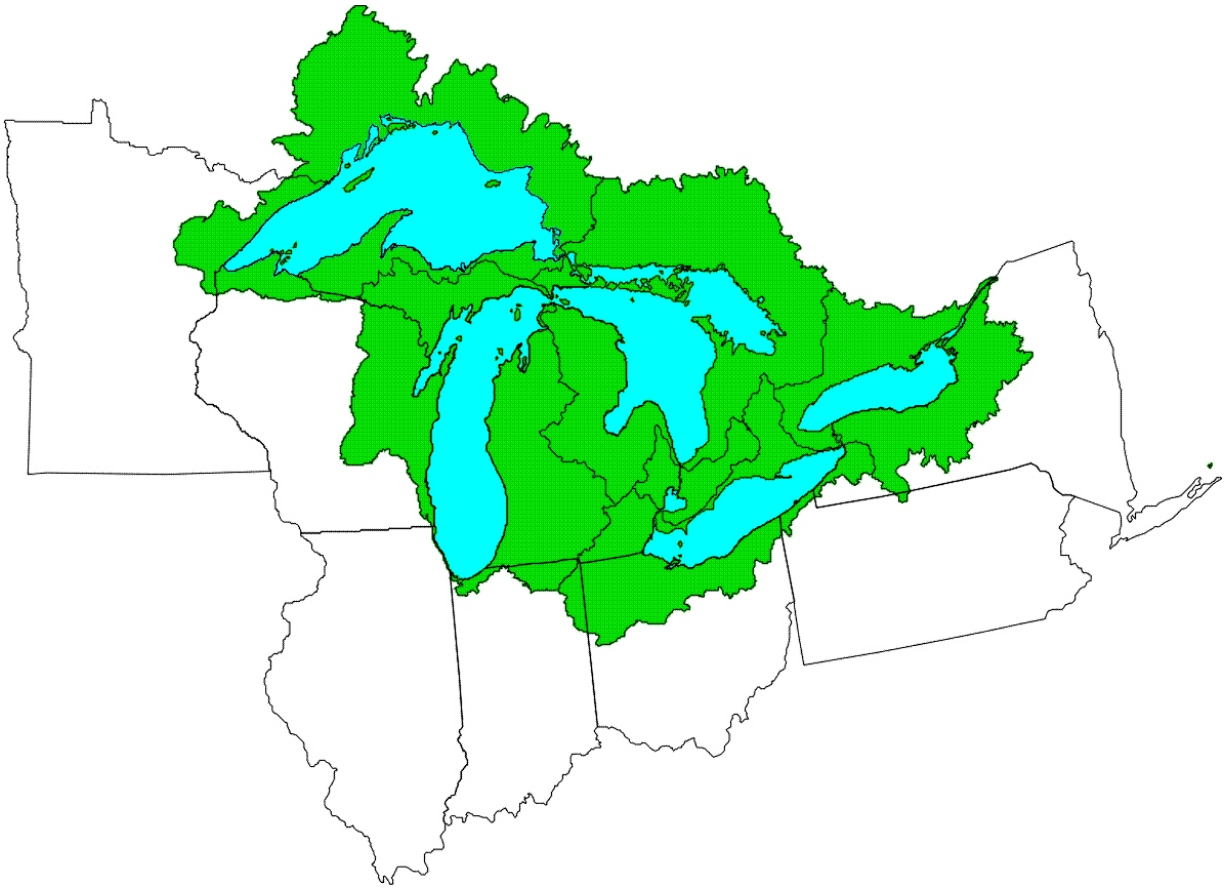
Great Lakes Recreational Boating

In response to Public Law 106-53, Water Resources Development Act of 1999, Section 455(c), John Glenn Great Lakes Basin Program, Great Lakes Recreational Boating

Main Report- Final



December 2008

US Army Corps of Engineers®

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
CIVIL WORKS
108 ARMY PENTAGON
WASHINGTON DC 20310-0108

DEC 15 2008

Honorable Nancy Pelosi
Speaker of the House of Representatives
U.S. Capitol Building, Room H-232
Washington, D.C. 20515-0001

Dear Madam Speaker:

Section 455(c) of the Water Resources Development Act of 1999 directed the Secretary of the Army, in cooperation with the Great Lakes States, to submit to a report to Congress detailing the economic benefits of recreational boating in the Great Lakes basin, particularly at harbors benefiting from operation and maintenance projects of the Army Corps of Engineers.

The attached report was prepared by the Detroit District of the Army Corps of Engineers, with assistance from the Great Lakes Commission. It is being transmitted for informational purposes only. It does not contain any conclusions or recommendations for Federal action.

The report does not include an evaluation of National Economic Development benefits that is a standard requirement for studies of water resources projects, pursuant to the Economic and Environmental Principles and Guidelines for Water and Related Land Resources. Instead, the report attempts to measure the regional economic impacts of recreational boating, in terms of boater spending and job creation in the Great Lakes basin. From a Federal perspective, boat harbors serving primarily or solely recreational users do not produce high priority outputs, as do harbors and waterways that support high volumes of commercial traffic. Therefore, the President's budget continues to give priority to those harbors and waterway segments that support high volumes of commercial traffic and significant commercial fishing, subsistence and public transportation benefits.

Very truly yours,

John Paul Woodley, Jr.

John Paul Woodley, Jr.
Assistant Secretary of the Army
(Civil Works)

Enclosure

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
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WASHINGTON DC 20310-0108

DEC 15 2008

Honorable Richard B. Cheney
President of the Senate
U.S. Capitol Building, Room S-212
Washington, D.C. 20510-0001

Dear Mr. President:

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Executive Summary

This report was prepared in response to Section 455(c) of the Water Resources Development Act of 1999, which directed the Secretary of the Army, in cooperation with the Great Lakes States, to submit a report to Congress detailing the economic benefits of recreational boating in the Great Lakes basin, particularly at harbors benefiting from operation and maintenance projects of the Army Corps of Engineers. This report was prepared by the Detroit District of the Army Corps of Engineers, with assistance from the Great Lakes Commission. It is for informational purposes only and does not contain any conclusions or recommendations for Federal action.

The report does not include an evaluation of National Economic Development benefits, defined in the Economic and Environmental Principles and Guidelines for Water and Related Land Resources, which is a standard requirement for studies of water resources projects. Instead, the report measures the regional economic impacts of recreational boating, in terms of boater spending and job creation in the Great Lakes basin. The 911,000 recreational boaters on the Great Lakes:

- spend $2.36 billion per year on boating trips;
- spend $1.44 billion per year on boats, boating equipment and supplies;
- create 60,000 jobs with $1.77 billion in personal income; and
- increase the quality of life and appreciation of the environment for many Americans.

The U.S. Coast Guard's registration data for 2003 indicated that there were almost 4.3 million recreational boats in the eight Great Lakes states (including boats registered both within and outside the Great Lakes basin) that year. This comprised a third of all U.S. recreational vessels, and represented a 1.3 percent increase over the five-year period between 1999 and 2003. Nearly one quarter of all recreational boats in the Great Lakes states belonged to people residing in Great Lakes shoreline counties.

One perspective on the economic impact of recreational boating in the Great Lakes basin can be drawn from an analysis of marina operations within the basin. Using data from a national list of permitted marinas and other sources, it is estimated that there are more than a quarter million marina slips available in Great Lakes states. About 51 percent of the slips are located in counties fronting the Great lakes and 89 percent are seasonal rental slips. An average of 93 percent of the accessible seasonal slips in the counties that border the Great Lakes were occupied during the summer of 2003. About 107,000 boats were kept in Great Lakes marinas during the boating season. These boat owners spent $665 million on trip-related expenses and $529 million on craft-related items.

Data used to estimate boating days, craft spending and trip spending for different size boats were obtained independently from on-line assessments conducted by the Recreational Marine Research Center (RMRC) at Michigan State University. According to the RMRC, an average boat owner using the Great Lakes spends about $3,600 per year on vessel ownership, including

$1,400 on craft-related expenses (e.g., equipment, repairs, insurance, slip fees) and $2,200 on boating trips (e.g., gas, oil, food, lodging) involving an average of 23 boat days. The averages are dominated by the high percentage of mostly smaller watercraft. Owners of larger boats spend considerably more than these averages, up to as high as $20,000 per year for boats 41 feet and more. Average spending per boat day on trips varies from $76 for boats less than 16 feet in length to $275 per day for boats larger than 40 feet. The largest trip expenses are for boat fuel (22%), restaurants and bars (17%) and groceries (14%). In 2003, registered watercraft users on the Great Lakes spent $2.36 billion on boating trips and $1.44 billion on craft expenses for a total of $3.8 billion. The majority of annual craft expenses are for equipment (39%), maintenance and repair (29%) and insurance (14%).

Comprehensive economic impacts of boater spending on the economy of the Great Lakes states (both internal and external to the Great Lakes basin) were estimated by applying the spending to an input-output model of the economy of the eight Great Lakes states. The model estimates direct and secondary economic impacts within the states in terms of sales, jobs, personal income (wages, salaries and employee benefits), and value added to the local economy (rent, profit and indirect business taxes). Direct effects cover economic activity in businesses selling goods and services directly to boaters. Secondary effects include indirect effects on related industries and induced effects from household spending of income earned directly or indirectly from boaters.

Applying this model, it is estimated that boater trip spending and craft related spending on the Great Lakes has a direct annual economic impact of approximately $2.8 billion in sales, $1 billion in personal income, $1.6 billion in value added to the local economy, and 39,000 jobs. With secondary effects added, the economic impact of registered recreational boaters that use the Great Lakes is approximately $5.1 billion in sales, $1.8 billion in personal income and $2.5 billion in value added, totaling $9.4 billion, and 60,000 jobs.

Great Lakes shallow draft harbors have functional value beyond that associated with recreational boating. Ten harbors are home to ferry operations which provide transportation services. Five harbors are home to Coast Guard search and rescue stations that are important to public safety. Sixteen harbors are dually classified as harbors of refuge, also contributing to public safety by providing boaters with safe haven during storms. Five harbors are considered subsistence harbors, which isolated island communities rely upon for goods and services.

Periodic maintenance, such as dredging and breakwater repairs, is needed for recreational boaters to use shallow draft harbors and access marinas. From a Federal perspective, boat harbors serving primarily or solely recreational users do not produce high priority outputs, as do harbors and waterways that support high volumes of commercial traffic. Therefore, the President's budget continues to give priority to those harbors and waterway segments that support high volumes of commercial traffic and significant commercial fishing, subsistence and public transportation benefits.

Abstract

This report was prepared in response to Section 455(c) of the Water Resources Development Act of 1999, which directed the Secretary of the Army, in cooperation with the Great Lakes States, to submit a report to Congress detailing the economic benefits of recreational boating in the Great Lakes basin, particularly at harbors benefiting from operation and maintenance projects of the Army Corps of Engineers. The report was prepared by the Detroit District of the Army Corps of Engineers, with assistance from the Great Lakes Commission. It is for informational purposes only and does not contain any conclusions or recommendations for Federal action. The report does not include an evaluation of National Economic Development benefits, as defined in the Economic and Environmental Principles and Guidelines for Water and Related Land Resources, which is a standard requirement for studies of water resources projects. Instead, the report measures regional economic impacts of recreational boating, in terms of boater spending and job creation in the Great Lakes basin.

Boating in the Great Lakes is a popular recreational activity for residents of and visitors to the region, which has an economic impact at the local, state and regional levels. Recreational boaters spend money in two ways: 1) by purchasing and maintaining their boats, and 2) by purchasing gas, oil, food and lodging each time they take a boating trip, whether it be for a short outing of an hour or two, or a multiple day cruise. For those who enjoy Great Lakes sport fishing but do not own a boat, the Lakes are home to a sizeable fleet of charter fishing boats. Recreational boating in the Great Lakes has an additional economic impact through the manufacturing and sales of watercraft in the region, and through the operations of marinas on, or connected to, Great Lakes waters.

The study provides a comprehensive regional analysis of the economic benefits of recreational boating to the Great Lakes states and translates those benefits to the Great Lakes basin, including the direct benefits generated by boater spending, and the secondary benefits derived through related activities such as watercraft manufacturing and sales, charter fishing and marina operation. The study also identifies the Federally authorized shallow draft harbors on the Great Lakes and characterizes the roles they play in the Great Lakes basin.

One necessity to recreational boating is access to the Great Lakes from the harbors and marinas at which boaters keep and/or launch their boats. Many of these access points are located in the 78 active Federally authorized shallow draft (14 feet of water depth or less) harbors on the Great Lakes and connecting channels. In addition to recreational boating, some of these harbors also support harbor of refuge, subsistence and public transportation benefits. From a Federal perspective, boat harbors serving primarily or solely recreational users do not produce high priority outputs, as do harbors and waterways that support high volumes of commercial traffic. Therefore, the President's budget continues to give priority to those harbors and waterway segments that support high volumes of commercial traffic and significant commercial fishing, subsistence and public transportation benefits.

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1. Introduction

1.1 Study Authority

This analysis was prepared in response to Section 455, part c, of the Water Resources Development Act (WRDA) of 1999, which authorized and directed the U.S. Army Corps of Engineers (Corps) to conduct a study of the economic impact that recreational boating provides on the Great Lakes, especially in relation to harbors that the Corps maintains. The full text of part c of the authorizing language is as follows:

SEC. 455. JOHN GLENN GREAT LAKES BASIN PROGRAM.

(c) GREAT LAKES RECREATIONAL BOATING.— Not later than 18 months after the date of enactment of this Act, the Secretary, using information and studies in existence on the date of enactment of this Act to the extent practicable, and in cooperation with the Great Lakes States, shall submit to Congress a report detailing the economic benefits of recreational boating in the Great Lakes basin, particularly at harbors benefiting from operation and maintenance projects of the Corps of Engineers.

1.2 Purpose and Scope

The report was prepared by the Detroit District of the Army Corps of Engineers, with assistance from the Great Lakes Commission. It is being transmitted for informational purposes only. It does not contain any conclusions or recommendations for Federal action.

The report does not include an evaluation of National Economic Development benefits that is a standard requirement for studies of water resources projects, pursuant to the Economic and Environmental Principles and Guidelines for Water and Related Land Resources. Instead, the report attempts to measure the regional economic impacts of recreational boating, in terms of boater spending and job creation in the Great Lakes basin. From a Federal perspective, boat harbors serving primarily or solely recreational users do not produce high priority outputs, as do harbors and waterways that support high volumes of commercial traffic. Therefore, the President's budget continues to give priority to those harbors and waterway segments that support high volumes of commercial traffic and significant commercial fishing, subsistence and public transportation benefits.

A principal mission for the Corps in the Great Lakes basin is the operation and maintenance of 139 federally authorized harbors and navigation channels. Many of these harbors were developed over a 150-year period to serve commercial navigation but others were built specifically for recreational boats. Additional harbors were also constructed to provide rough weather refuge for small craft/recreational boats, serving as "harbors of refuge". Periodic dredging is required to maintain navigation channels at authorized depths. Maintenance of harbor structures such as breakwaters and piers is also required. During the past several years, the Great Lakes (especially Lakes Huron, Michigan and Erie) have experienced periods of relatively low and falling water levels.

Water is a vital natural resource and is the defining characteristic of the Great Lakes basin. More than 95,000 square miles of navigable water has allowed a large marine recreation industry to anchor itself. Recreational boating and commercial operations such as ferries and charter fishing depend on adequate infrastructure including launch ramps, docks, and dredging. The Great Lakes' marine recreation sector has an obvious dependency on the water, but its connection to the shore and supporting infrastructure also is vital. This study is a comprehensive effort to analyze the regional economic effects of Great Lakes recreational boating.

Boating in the Great Lakes provides a great deal of activity and enjoyment, but it also supports a number of important industries in the Great Lakes states, generating income and jobs especially in coastal communities. Impacts are estimated by tracing the flow of spending of boaters within the regional economy to identify jobs and income resulting from this spending. The analysis includes associated businesses such as marinas, charter boats and boat dealers as well as the broader impacts of boaters on tourism industries and supporting businesses.

While previous economic impact studies have focused on state-specific and industry sector-specific aspects of recreational boating, this study embraces the entire eight-state area, and identifies the total regional impact, direct and secondary, generated by Great Lakes boaters and the industry that supports them. Much of the data on boater spending was collected by Michigan State University's Recreational Marine Research Center (RMRC) through on line consultation involving the National Boater Panel formed in 2003 and now comprised of some 10,000 volunteer recreational boaters willing to report their ongoing spending activity.

1.3 Location of Study

The geographic purview of the study includes the eight Great Lakes states of Minnesota, Wisconsin, Illinois, Indiana, Ohio, Michigan, Pennsylvania and New York, internal and external to the Great Lakes drainage basin. This work primarily focuses on recreational boating activity in Great Lakes coastal zones and connecting channels.

1.4 Prior Studies and Reports

In May 2000 the USACE began a four-month initial study effort to assess data in support of future economic benefit/impact studies regarding recreational boating on the Great Lakes.

These studies were initiated in recognition of the USACE Cost Saving Initiative Process and its implications for the maintenance of federally authorized Great Lakes harbors. Great Lakes recreational boating and related sports fishing are a large part of the region's tourism and outdoor recreation economy. The economic impact of these activities accrues to both coastal locations and places inland depending on retail expenditures and levels of participation. A thorough accounting of the economic benefits of U.S. Great Lakes recreational boating addresses its relationship to the regional economy.

Two specific products were produced in 2000, including an illustrated, eight-page booklet presenting an economic summary of recreational boating in the Great Lakes and St. Lawrence

River, and a 23-page report titled *Recreational Boating and the Great Lakes: An Initial Assessment of Data in Support of Future Economic Benefit/Impact Studies.*

1.5 Existing Conditions

The five Great Lakes, Superior, Michigan, Huron, Erie and Ontario, and their connecting channels form the largest fresh surface water system on earth. Covering nearly 95,000 square miles, these freshwater seas hold an estimated 6 quadrillion gallons of water, about one-fifth of the world's fresh surface water supply and nine-tenths of the U.S. supply.

The channels that connect the Great Lakes are an important part of the system. The St. Marys River is the northernmost of these, a 60-mile waterway flowing from Lake Superior down to Lake Huron. At the St. Marys rapids, the Soo Locks bypass the rough waters, providing safe transport for ships. The St. Clair and Detroit rivers, and Lake St. Clair between them, form an 89-mile long channel connecting Lake Huron with Lake Erie. The 35-mile Niagara River links Lakes Erie and Ontario; the manmade Welland Canal also links the two lakes, providing a navigation route around the falls. From Lake Ontario, the water from the Great Lakes flows through the St. Lawrence River to the Atlantic Ocean about 1,000 miles away.

The Great Lakes basin encompasses 295,710 square miles with the Great Lakes and their connecting channels making up about a third of this area. Forests account for the largest percentage of total basin area, at about 40 percent. Agriculture accounts for about a quarter of basin area. The “built environment” representing industrial, commercial, residential, institutional, and transportation uses takes up less than 3 percent of the area of the Great Lakes basin. As of the 2000 census, the eight Great Lakes states were home to 75.4 million people, or almost 27 percent of the U.S. population.

The Great Lakes basin is the resource centerpiece of a major industrial and agricultural region in North America. Although the basin encompasses an international border, an integrated resource base and manufacturing complex has developed. This binational regional economy with its historical ties to the Great Lakes and its manufacturing sector strengths is continuing to evolve. The region’s economic future will have to contend with increased competition within the domestic and global economies, a maturing industrial and supporting infrastructure, continued urbanization and the environmental impact of economic and social activity. While there have been several state-specific and resource-specific studies of recreational boating in the region, there has been, to date, no such study undertaken for the Great Lakes.

The Corps’ cost-benefit calculation methodology accounts for changes in the economic value of the national output of goods and services (national economic development (NED)) as opposed to the regional economic development (RED) account, which registers changes in the distribution of regional economic activity that result from each alternative plan formulated to address a problem. This analytical approach does not fully take into account boating related spending by residents of the region in terms of local economic development efforts and a broad variety of boating related businesses.

Although the vast majority of direct spending is by residents of Great Lakes states and not new spending by out-of-region residents, it is significant to many Great Lakes local economies. A decline in boating activity and its related spending could have significant negative income and employment impacts in coastal counties where boating is a prominent attractor of income from outside theses communities. Clearly many coastal communities benefit from boating related income redistribution. In addition, boating facilities and services, and the related preservation of access to the Great Lakes, is important in creating and preserving the character of coastal communities, which in turn, makes them destinations for tourism.

1.6 Problems and Opportunities

Estimates for some 50 recreational harbors in the Corps' Detroit and Buffalo Districts indicate that, in Fiscal Year 2005 there remained about 750,000 cubic yards of material that needed to be dredged to fully maintain shallow draft harbors. The cost to complete the unmet dredging needs in these 50 recreational harbors in FY05 was estimated at $7.6 million.

Data generated by this study identifies significant regional economic benefits derived in Great Lakes states from such activities as Great Lakes boating spending, marina operation, charter fishing and boat sales and manufacturing. The study also identifies the dredging status of all 87 authorized recreational harbors, many of which have critical dredging backlogs.

The assumption that lower lake levels contribute to diminished boating activity, and may have an effect on the local economy, is reviewed by two other recent studies in the Great Lakes basin, as described below.

The March, 2001 analysis "Economic Impact of Lake Michigan Levels on Recreational Boating and Charter Fishing in Five Counties," (Mahoney, Stynes and Pistus, 2001) documented the negative effects low water levels at the time on boating activity and associated economic impact in a study area covering three Lake Michigan coastal counties in Wisconsin and two in Michigan. The study estimated that, for the two southwestern Michigan counties alone, a loss of 12 inches of draft from 2000 water levels would have a direct negative economic impact of $4.75 million to marinas and non-boating businesses in the two counties.

The International Joint Commission-sponsored report, "Estimating the Economic Impact of Changing Water Levels on Lake Ontario and the St. Lawrence River for Recreational Boaters and Associated Businesses," (Connelly, Bibeault, J. Brown and T. Brown, 2005) attributed a potential $7.5 million loss in economic benefits to a hypothetical month-long period of low water levels (244 chart datum) on Lake Ontario.

While the above two studies deal with economic impact of diminished water depth caused by lake level fluctuations, it can be reasonably assumed that loss of water depth in recreational harbors due to other factors could have similar effects on recreational boating activity and its regional economic benefits.

This study also notes that there is economic benefit generated in many Great Lakes shallow draft recreational harbors by navigation activity other than recreational boating such as ferries, water

taxis, excursion vessels, dinner cruise vessels and other similar operations. A follow up analysis of the total economic impact of these harbor users would further inform the discussion on the Federal interest in maintaining these harbors.

Finally, at least five Great Lakes recreational harbors house U.S. Coast Guard small boat stations, located strategically to provide search and rescue service coverage to Great Lakes coastal areas.

2. Economic Impact of Recreational Boater Spending

At the core of this study is the economic impact on the Great Lakes states of recreational boaters, including what they spend directly both on each boating trip and on their boats over the course of the year, and the secondary economic impact generated by boater spending. While these impacts have been defined on state-specific basis in recent years, they had not been calculated on a Great Lakes basin-wide basis to the degree of accuracy now available. Using newly developed technologies and techniques, data was collected in 2004 providing a snapshot of annual boater spending levels and patterns unprecedented in its scope and detail.

2.1 Methodology

Estimates of boater spending are based on the number of registered craft in each Great Lakes state, the numbers of marina slips in Great Lakes states, and spending and activity patterns of recreational boaters as measured in a 2003-2004 boater assessment.

The number of registered craft in the seven Great Lakes states (other than Pennsylvania) was obtained from an analysis of data provided by Info-Link a company that regularly analyzes boat registration data. For Pennsylvania, the only boaters included were those living in Erie County, the state's only Great Lakes-fronting county[1].

Boats were segmented into six size classes based on length in feet (<12, 12-15, 16-20, 21-28, 29-40 and 41+). Info-Link provided an Access database of watercraft that had "current registrations." These are boats eligible to be operated the summer of 2004. The number of boats differs from the U.S. Coast Guard-reported registration information, which in some instances contains boats whose registrations have lapsed. Some states keep these boats on their registration lists because a high percentage will re-register.

The number of boats kept at marinas was estimated from a national marina database. The national marina database was developed using information on permitted marinas that was being developed for a national study of marinas being conducted for the Association of Marina Industries. This database included permitted marinas in Great Lakes states. This database was supplemented with information obtained from studies of the impacts of low Lake Michigan water levels and from a series of continuing marina studies conducted by the Recreation Marine Research Center at Michigan State University. This list included the number of permitted slips for each marina on the list. The Great Lakes marinas that are identified in the database were then verified though a search of telephone books, web pages, marina directories and harbor guides, and phone calls. A very high percentage of Great Lakes marinas on the list were verified through this approach.

[1] Numerous requests were made to obtain the registration data for Pennsylvania. This included letters and phone calls to the agency that administers boating registrations. Because of the inability to acquire this registration data, the number and types (e.g., sizes) of registered boats for other counties were not available. The only information that was available was for Erie County.

First, all marinas in each state, and marinas specifically serving the Great Lakes and connecting waters were identified using zip codes of marinas and bodies of water. Telephone calls were placed to marinas located in zip codes bordering the Great Lakes to verify the numbers of seasonal slips. The information collected through this study was used to estimate percentages of seasonal slips in these marinas. The estimates of the percentages of seasonal slips in the Great Lakes states are presented in Table M1. An occupancy rate of 93 percent was applied to the number of seasonal slips to estimate the number of occupied marina slips and occupied Great Lakes marina slips in each state.

Boats stored at marinas (based on occupied seasonal slips) were allocated to boat size classes based on the number of boats in each size class in each state and the propensities of boats of each size class to use marinas. In depth research of Michigan registered boaters in 1994 and 1998 revealed the percentages of boats in each size class stored at marinas. The result of this research was the development of models of the geographic distribution and storage type (e.g., marinas, waterfront homes). Distributions of these propensities were verified using information from the registration information collected from Great lake boaters who are members of the National Boater Panel.

These distributions were applied to the other states, taking into account the number of marina slips in each state and differences across the eight states in the distribution of registered boats by size group. Registered boats stored at marinas were split out of each size class, yielding the following nine boat segments:

Boats not stored in marina slips or moorings

Boats <16 feet
Boats 16-20 feet
Boats 21-28 feet
Boats 29-40 feet
Boats 41 feet or longer

Boats stored in marina slips or moorings

Boats up to 20 feet
Boats 21-28 feet
Boats 29-40 feet
Boats 41 feet or longer

Boat size and storage segments explain much of the variation in boater spending patterns. Distinct trip and annual craft spending averages were estimated for these nine segments using the 2003-2004 boater panel assessment.

Spending averages for boats registered in Great Lakes states were not significantly different than the national averages[2]. Trip spending was estimated on a per boat day basis, while craft expenses were estimated on an annual basis per boat.

[2] These spending averages were estimated for both the national sample (N= 3,372 trips from 5,050 boats) and boats registered in one of the Great Lakes states (N= 553 trips from 863 boats). Since the averages were not significantly different between the two samples, the national averages were used. These were deemed more reliable since they

Spending averages within segments were applied to the numbers of registered craft in each state. Craft expenses are estimated by multiplying an annual average spending per boat times the number of boats in each segment. Annual spending on trips is calculated by first estimating the number of boat days by segment. Boat days are computed by multiplying the average number of days of use times the number of boats in each segment. Average days of use were estimated for the nine segments using the 2003-2004 boat panel assessment data. Trip spending is then estimated by multiplying boat days by the average spending per boat day of each segment.

Total spending estimates are applied to input-output models to estimate economic impacts. Statewide impacts are estimated for each state using overall statewide boat registrations and an input-output model for each state. Impacts are also estimated for boats using the Great Lakes and for boats stored at Great Lakes marinas. Spending and impacts for Pennsylvania only cover Erie County.

Secondary sources do not clearly or consistently identify boats using the Great Lakes. Statewide registered boater studies conducted in Michigan (Stynes, Wu and Mahoney 1998) have identified the proportion of boats of different size classes using the Great Lakes and also identified boats stored at sites with Great Lakes access.

Other states and boater studies have often used boats registered in Great Lakes counties as an indicator of Great Lakes use. Most states report registrations by place of residence rather than where the boat is located. Many boats kept at marinas or seasonal homes are stored and used in a different county than where the boater lives.

There are also rivers, streams and inland lakes in Great Lakes counties that do not provide Great Lakes access. While boaters living in counties adjacent to the Great Lakes are more likely to use the Great Lakes, many smaller craft in these counties are not used on the Great Lakes. Estimates of the number of boats using the Great Lakes will therefore be subject to unknown errors. The procedures applied to Michigan boat registrations balance quite well with previous estimates of the distribution of boating activity between the Great Lakes and inland waters in Michigan. There may, however, be some differences across states in Great Lakes use that will not be fully taken into account.

As part of this study, the IMPLAN® system (a widely used input-output economic impact and analysis modeling system) was utilized. IMPLAN, which was originally developed for the U.S. Forest Service for economic analyses of proposed national forest management plans, was refined and expanded by the Minnesota IMPLAN Group, Inc. to analyze more socioeconomic variables. One of the advantages of the IMPLAN system is its ability to assess the economic impacts of recreational and tourism spending. The analysis for this study uses 2001 economic data for each Great Lakes state as input.

Specifically, a fixed set of retail and wholesale margins (differences) for goods bought by boaters is applied across the seven states to indicate average profit. Twenty percent of manufactured goods bought by boaters, including petroleum, are assumed to be made within the

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were based on a much larger sample. The sample of boats registered in Great Lakes states and reported trips was too small for individual states and boat segments to be reliable.

state. This means that eighty percent is assumed to be imported or not to represent production that would otherwise be lost to the state.

The primary impacts from boater purchases of goods (groceries, fuel, equipment, souvenirs) are the retail margins (profits) that accrue as a gain to the region where the good is purchased. The producer portion of the purchaser prices accrue to where the good is manufactured, often considerably removed from the point of purchase and in most cases outside the Great Lakes states. Fuel purchases represent a significant percentage of boater spending, so the Regional Purchase Coefficient (RPC) used for petroleum refining affects the amount of production (direct sales) attributed to the region. The choice of RPC's for petroleum refining has a much smaller impact on estimates of income, jobs, and value added, as petroleum refining supports only .39 jobs per million dollars of sales and only 6% of petroleum sales represents value added.

Considering the Great Lakes states, using a 20% RPC figure, petroleum refining accounts for only 180 jobs and $28 million in value added out of 106,728 direct jobs and $1.678 billion value added from boater spending (Tables 5). Petroleum refining therefore accounts for only .17% () of the direct employment and value added effects of boater spending. If we assumed all fuel purchased by boaters was refined locally, the contribution would still be less than 1% (five times figure with RPC=20%). Use of a constant 20% RPC for petroleum refining will slightly underestimate impacts in states with RPC's greater than 20% and slightly overestimate them in states with smaller RPC's. The 20% figure chosen is somewhat arbitrary, but was designed to be consistent with the RPC value used for other goods to yield an overall rough aggregate estimate of impacts on manufacturing sectors.

RPC's for other goods are more problematic as we do not know exactly what goods were purchased and boater spending categories for goods do not align perfectly with IMPLAN sectors. The RPC choices do not significantly affect the impact estimates as most of the impacts are from purchases of services and retail margins. IMPLAN's regional purchase coefficients (RPC) for petroleum range from 87 percent for Illinois to only 3 percent for New York.

As a significant share of boater spending goes to purchases of boat and auto fuel, these differences in RPC's would yield quite different impacts in each state if the associated petroleum refining were included. However, it is unlikely that boater fuel purchases impact fuel production in each state, as boating makes up a small percentage of all fuel sold and any unused refining capacity can readily find other markets.

Impact estimates use sector-specific economic ratios and multipliers from input-output models for each state estimated with the IMPLAN system and 2001 economic data. Basin-wide impact estimates use an input-output model covering the seven Great Lakes states and Erie, County, PA. Employment to sales ratios are adjusted to 2003 based on an overall price index. Sales, income and value added ratios are not adjusted. Spending categories are matched with IMPLAN sectors based on North American Industry Classification Standards (NAICS) classifications. Marinas are part of a broader amusements and recreation sector. Economic ratios and multipliers for marinas may differ somewhat from the overall averages for this sector.

2.2 Calculating Boating Days, Craft Spending and Trip Spending

Data used to estimate boating days, craft spending and trip spending for different size boats were obtained independently from on-line assessments conducted of the National Recreation Marine Research Center's National Boater Panel. A primary purpose of this continuing series of on-line assessments was to collect information needed to verify participation (e.g., number of persons boating, boating days, boating activities, type and length of boating trips) and the economic significance of boating.

2.3 Boater Spending Summary

An average Great Lakes boat owner spends about $3,600 per year on their boat including $1,400 on craft-related expenses (e.g., equipment, repairs, insurance, slip fees) and $2,200 on boating trips (e.g., gas and oil, food, lodging) involving an average of 23 boat days. These averages are dominated by the high percentage of mostly smaller watercraft[3]. Owners of larger boats spend considerably more than these averages, up to as high as $20,000 per year for boats 41 feet and more.

Table 1. Average Trip Spending by Segments ($ per boat per day)

Category	Not Marina					Marina			
	Less than 16'	16-20'	21-27'	28-40'	More than 40'	Less than 21'	21-28'	28-40'	More than 40'
Lodging	$11.73	$9.01	$13.94	$2.29	$9.14	$8.85	$17.46	$10.60	$12.05
Marina Services	$1.30	$2.42	$6.35	$16.35	$29.03	$1.43	$6.16	$20.86	$31.80
Restaurant	$12.92	$17.18	$24.40	$36.51	$46.32	$17.53	$29.27	$37.07	$49.46
Groceries	$12.82	$13.33	$19.68	$24.50	$40.29	$13.41	$20.72	$25.28	$50.28
Boat Fuel	$10.97	$24.09	$39.69	$48.70	$75.03	$22.84	$46.38	$43.94	$78.10
Auto Fuel	$11.54	$13.42	$14.21	$6.56	$6.27	$13.12	$11.18	$6.42	$5.87
Repair/Maintenance	$8.24	$11.16	$12.18	$29.97	$23.69	$10.86	$11.12	$10.16	$19.29
Marine Supplies	$4.35	$7.02	$11.31	$14.81	$20.95	$9.25	$10.24	$10.72	$14.83
Recreation/Entertainment	$1.65	$2.39	$6.76	$6.04	$11.32	$1.30	$5.42	$8.20	$7.57
Shopping	$0.76	$2.00	$4.33	$6.96	$8.17	$2.46	$5.43	$6.98	$15.88
Total per Boat Day	$76.00	$102	$153	$193	$270	$101	$163	$180	$285
Average Days Boated per Year	17.7	24.4	33.4	39.9	42.1	28.0	34.7	40.7	44.3

Source: National Boater Panel Report (2004)

Boating activity and spending vary with boat size and storage. Average spending per boat day on trips varies from $76 for boats less than 16 feet in length to $275 per day for boats larger than 40 feet. The greatest trip expenses are for boat fuel (22%), restaurants and bars (17%) and groceries (14%). Boat storage (marina or not) does not significantly influence trip spending. Boat use also varies directly with the size of the boat from 18 days per year for boats less than 16 feet to 42 days for the largest craft. Boats stored at marinas are used slightly more days per year than boats stored elsewhere. (Table 1).

[3] Eighty-seven percent of registered boats in the Great Lakes states are 20 feet or less in length.

Annual craft expenses vary more dramatically by size. Boat size classes are therefore good predictors of spending. For boats not stored at marinas, boat owners spend an average of about $900 per year for boats under 16 feet, $2,400 for boats 21-27 feet in length and almost $10,000 per year for boats over 40 feet (Table 2). Boats stored at marinas incur additional expenses for slip rentals, raising their annual craft expenses to an average of $3,800 for 21-27 foot boats and $11,000 per year for boats over 40 feet. The majority of annual craft expenses are for equipment (39%), maintenance and repair (29%) and insurance (14%). New boat purchases are not included in these figures.

Table 2. Average Annual Craft Spending in the Great Lakes by Segment ($ Per Boat)

Spending Category	Non-Marina					Marina				Total
	Less than 16'	16-20'	21-27'	28-40'	More than 40'	Less than 21'	21-28'	28-40'	More than 40'	
Slip	$9	$6	$8	$9	$6	$875	$1,300	$2,266	$3,547	$1,271
Yacht dues	$9	$19	$56	$267	$740	$149	$142	$300	$507	$201
Off season storage	$19	$28	$69	$234	$194	$110	$201	$488	$487	$263
Put in and haul out	$42	$33	$99	$296	$563	$59	$134	$351	$571	$222
Insurance	$113	$193	$366	$904	$2,119	$267	$343	$742	$1,445	$569
Repairs	$246	$421	$734	$1,581	$3,900	$550	$817	$1,474	$2,276	$1,111
Equipment	$441	$507	$924	$1,590	$1,855	$514	$788	$1,303	$1,872	$1,045
Taxes	$27	$43	$103	$252	$457	$49	$60	$186	$510	$148
Total	$906	$1,249	$2,360	$5,133	$9,834	$2,573	$3,784	$7,109	$11,214	$4,830

Source: National Boater Panel Report (2004)

Total Great Lakes state boater trip and craft spending can be estimated by applying the averages in Tables 1 and 2 to the numbers of registered watercraft in each state[4]. An analysis of spending profiles showed that there were no statistically significant differences in averages between national and Great Lakes. As a result, the national data set was used because of the added reliability associated with larger sample sizes. The number of registered watercraft and the distribution of boats in each state explain differences across states, across the nine boat segments.

[4] Spending and impact results therefore do not include spending associated with large numbers of unregistered boats or boat rentals.

SPENDING AND IMPACTS OF ALL REGISTERED WATERCRAFT ON THE GREAT LAKES STATES ECONOMY – INCLUDES WATERCRAFT EXTERNAL TO THE GREAT LAKES

Table 3. Total Trip Spending by Segment ($ Millions)

Spending Category	Non-Marina					Marina				Total
	Less than 16'	16-20'	21-27'	28-40'	More than 40'	Less than 21'	21-28'	28-40'	More than 40'	
Lodging	$400	$370	$154	$2	$1	$9	$70	$21	$4	$1,031
Marina Services	$44	$99	$70	$15	$4	$1	$25	$41	$9	$310
Restaurant	$440	$706	$270	$34	$7	$18	$117	$73	$14	$1,679
Groceries	$436	$548	$218	$23	$6	$14	$83	$50	$15	$1,392
Boat Fuel	$374	$990	$439	$45	$11	$24	$186	$87	$23	$2,177
Auto Fuel	$393	$552	$157	$6	$1	$14	$45	$13	$2	$1,181
Repair/ Maintenance	$281	$459	$135	$28	$3	$11	$44	$20	$6	$987
Marine Supplies	$148	$289	$125	$14	$3	$10	$41	$21	$4	$655
Recreation/ Entertainment	$56	$98	$75	$6	$2	$1	$22	$16	$2	$278
Shopping	$26	$82	$48	$6	$1	$3	$22	$14	$5	$206
Total	$2,598	$4,194	$1,690	$178	$39	$105	$653	$355	$83	$9,895

Note: Trip spending totals are estimated by multiplying per-day spending averages in Table 1 by the number of boat days by registered watercraft in each boat segment (Table M5). Boat days are estimated by multiplying the number of registered watercraft in each segment by the average days per boat for that segment (Table 1), based on national averages for boat size and class. Trip spending totals cover all watercraft registered (statewide) in Great Lakes States (except only Erie County in PA). All Figures are in $ millions.

Table 4. Total Annual Craft Spending by Segment in Great Lakes States ($ Millions)

Spending Category	Non-Marina					Marina				Total
	Less than 16'	16-20'	21-27'	28-40'	More than 40'	Less than 21'	21-28'	28-40'	More than 40'	
Slip	$17	$11	$3	$0	$0	$32	$150	$110	$23	$346
Yacht dues	$17	$33	$18	$6	$3	$5	$16	$15	$3	$117
Off season storage	$37	$47	$23	$5	$1	$4	$23	$24	$3	$167
Put in and haul out	$80	$55	$33	$7	$2	$2	$15	$17	$4	$216
Insurance	$218	$325	$121	$21	$7	$10	$40	$36	$10	$787
Repairs	$473	$709	$243	$37	$13	$20	$94	$71	415	$1,676
Equipment	$847	$854	$306	$37	$6	$19	$91	$63	$12	$2,236
Taxes	$53	$72	$34	$6	$2	$2	$7	$9	$3	$187
Total	$1,742	$2,106	$781	$119	$34	$95	$437	$344	$74	$5,731

Note: Craft spending totals are estimated by multiplying the per boat annual craft spending averages in Table 2 by the number of registered watercraft in each boat segment (Table R7). Craft spending totals cover all watercraft registered (statewide) in Great Lakes States (except only Erie County in PA). All Figures are in $ millions.

Registered watercraft in Great Lakes states[5], which includes watercraft registered inside and outside the Great Lakes basin, spent almost $10 billion on boating trips in 2003 (Table 3) and $5.7 billion on craft expenses (Table 4) for a total of almost $16 billion. Boats stored at marinas account for 12 percent of trip spending and 17 percent of craft spending.

2.4 Economic Impacts of Boater Spending

The economic impacts of boater spending on the Great Lakes states' economy can be estimated by applying the spending to an input-output (I-O) model of the states' economy. For the Great Lakes basinwide analysis, a model was estimated for the eight Great Lakes states[6]. The I-O model was estimated using the IMPLAN system, (MIG. Inc. 1999) and 2001 economic data for the states. Trip and craft spending categories were matched with IMPLAN sectors based on NAICS.

The model estimates direct and secondary economic impacts within the Great Lakes states in terms of sales, jobs, personal income, and value added[7]. Direct effects cover economic activity in businesses selling goods and services directly to boaters. Secondary effects include indirect effects on backward linked industries and induced effects from household spending of income earned directly or indirectly from boaters. The aggregate sales multipliers for the Great Lakes states are 1.9 for trip-related spending and 1.7 for craft-related spending[8]. Multipliers for individual states are slightly lower than for the Great Lakes states as a whole.

Economic impacts are estimated separately for trip and craft-related spending.
The $9.9 billion in boater trip spending has a direct economic impact on the Great Lakes states of $6.8 billion in sales[9], $2.5 billion in personal income, $1.7 billion in value added, and 107,000 jobs. With secondary effects, the total impact of boater trip spending is 160,000 jobs and $4.3 billion in personal income (Table 5).

Boater craft spending has a direct economic impact on the Great Lakes states of $4.6 billion in sales, $1.6 billion in personal income, $2.9 billion in value added, and 51,000 jobs. With secondary effects, the total impact of craft-related boater spending is 84,000 jobs and $2.9 billion in personal income (Table 6). Combining trip and craft-related spending, the total impact on the Great Lakes states economy is 244,000 jobs and $7.2 billion in personal income.

Table 5. Average Annual Economic Impacts of Trip Related Spending for Registered Boats in Great Lakes States (counting impacts within and outside the Great Lakes basin)

[5] For Pennsylvania only boats registered in Erie County are included.
[6] Only Erie County was included for Pennsylvania.
[7] See the Glossary for definitions of economic terms
[8] The aggregate multipliers represent weighted averages of multipliers for individual sectors in proportion to their share of boater spending.
[9] Direct sales are less than total spending as it excludes producer prices of goods bought at retail that are not manufactured within the region. Only 20% of the producer prices of goods bought at retail are assumed to create impacts on manufacturing sectors. The remainder represents imports or production not directly affected by boater spending. A large percentage of the excluded sales are associated with boat and auto fuel purchases. The models do capture 100% of the retail margins on these purchases and 60% of wholesale margins.

Sector/Spending Category	Sales $ Millions	Jobs	Personal Income $ Millions	Value Added $ Millions
Direct Effects				
Lodging	$1,031	16,416	$450	$730
Marina services	$310	4,100	$115	$194
Restaurant	$1,679	43,421	$712	$803
Recreation/entertainment	$278	3,681	$103	$174
Repair/maintenance	$987	7,222	$193	$506
Food processing	$217	915	$37	$57
Marine supplies	$55	332	$14	$17
Petroleum Refining	$466	180	$21	$28
Retail Trade	$1,444	27,979	$688	$899
Wholesale Trade	$349	2,308	$134	$235
Other Local Production	$22	175	$7	$10
Total Direct Effects	$6,838	106,728	$2,474	$3,652
Secondary Effects	$5,858	53,156	$1,803	$1,678
Total Effects	$12,696	159,884	$ 4,277	$ 5,330
Multiplier	1.9	1.5	1.7	1.5

Table 6. Average Annual Economic Impacts of Craft Related Spending for Registered Boats in Great Lakes States (counting impacts within and outside the Great Lakes basin)

Sector/Spending Category	Sales $ Millions	Jobs	Personal Income $ Millions	Value Added $ Millions
Direct Effects				
Slip	$346	4,577	$129	$216
Yacht dues	$17	1,548	$44	$73
Off season storage	$67	2,211	$62	$104
Put in and haul out	$216	2,857	$80	$135
Insurance	$787	6,870	$382	$682
Repairs	$1,676	12,269	$328	$859
Retail Trade	$930	18,019	$443	$579
Wholesale trade	$223	1,471	$85	$150
Local Manufacturer	$187	1,134	$46	$57
Total Direct Effects	$4,647	50,955	$1,600	$2,855
Secondary Effects	$3,447	33,095	$1,261	$2,047
Total Effects	$8,095	84,051	$2,861	$4,902
Multiplier	1.7	1.6	1.8	1.7

Note 1: Impacts of both trip and craft spending are estimated by applying the total trip spending in Table 3 and total craft spending in Table 4 to an input-output model of the Great Lakes states economy. The I-O model was estimated using the IMPLAN (MIG, Inc. 2004) system for the seven Great Lakes states (IN, IL, MI, MN, NY, OH, and WI) and Erie County, PA. The I-O model was estimated using 2001 economic data. Distinct multipliers were used for each sector. The aggregate multipliers reported at the bottom of the table are based on the distribution of boater spending across these sectors. Only 20% of goods purchased by boaters (fuel, groceries, equipment, sporting goods, clothing and souvenirs) are assumed to be made in the seven Great Lakes states. This area is assumed to capture 100% of the retail margins on these purchases and 60% of wholesale margins.

Note 2: Direct effects cover impacts on businesses that sell directly to boaters and the associated wholesale margins and local production associated with retail sales. Secondary effects include both indirect effects on backward linked industries and induced effects from household spending of income earned directly or indirectly from boater spending. Only economic activity within the Great Lakes states is included. Total effects are the sum of direct and secondary effects. Multipliers are the ratio of total effects to direct effects. Sales represent sales captured by local firms. Direct sales is less than total spending as it excludes the producer prices of goods not manufactured in the Great Lakes states. Jobs are not full time equivalents but include part time and full time positions. Jobs estimates do account for seasonal positions -- three seasonal jobs of 4 months each equates to one job. Personal income includes wages and salaries, income of sole proprietors and payroll benefits. Value added is the sum of personal income, rents and profits and sales and other indirect business taxes.

2.5 Boater Spending and Impacts for Boats Using the Great Lakes

Spending and impact totals above cover all registered watercraft in these states. With a few assumptions, we can also estimate spending and impacts associated with boating activity on the Great Lakes and connecting waters. This requires the identification of which registered boats use the Great Lakes. By utilizing statewide registered boater studies in Michigan (Stynes, Wu and Mahoney 1998) and by identifying marinas that serve the Great Lakes, some initial estimates can be made. Larger boats and boaters living near the Great Lakes are more likely to use them.

Some previous studies have used the number of registered watercraft in counties adjacent to the Great Lakes as an indicator of boats using the Great Lakes. However, many smaller boats in these counties predominantly use inland waters and many boaters who do not live in counties adjacent to the Great Lakes store their boats at Great Lakes marinas or nearby seasonal homes. The number of registered boats using the Great Lakes for each state was estimated based on propensities of boats of each size class to use the Great Lakes, the number of Great Lakes marina slips in each state and the percentage of registered watercraft in counties adjacent to the Great Lakes (Table 33. The procedure provides rough estimates of the number of boats using the Great Lakes by state within the nine boat segments.

AVERAGE ANNUAL SPENDING AND IMPACTS OF REGISTERED WATERCRAFT USING THE GREAT LAKES

Table 7. Total Trip Spending for Registered Boats Using the Great Lakes ($ Millions)

Spending category	Not Marina					Marina				
	Less than 16'	16-20'	21-27'	28-40'	More than 40'	Less than 21'	21-28'	28-40'	More than 40'	Total
Lodging	$55	$68	$43	$1	$1	$4	$37	$12	$3	$223
Marina services	$6	$418	$20	$7	$2	$1	$13	$24	$7	$98
Restaurant	$61	$130	$75	$16	$4	$7	$61	$43	$10	$407
Groceries	$61	$100	$61	$10	$3	$5	$43	$30	$11	$324
Boat fuel	$52	$182	$122	$21	$6	$9	$97	$51	$16	$556
Auto fuel	$55	$101	$44	$3	$0	$5	$23	$8	$1	$240
Repair/Maintenance	$39	$84	$38	$13	$2	$4	$23	$12	$4	$219
Marine supplies	$21	$53	$35	$6	$2	$4	$21	$13	$3	$157
Recreation/ Entertainment	$8	$18	$21	$3	$1	$1	$11	$10	$2	$73
Shopping	$4	$15	$13	$3	$1	$1	$11	$8	$3	$59
Total ($ Millions)	$360	$769	$471	$82	$21	$41	$342	$211	$60	$2,357

Note: Computed in the same way as Table 3 but using numbers of watercraft using the Great Lakes (Table 32). Differences in use and spending patterns of Great Lake boaters and inland boaters are explained by the boat segments. Boats using the Great Lakes are generally larger than boats that are only used on inland waters and more likely to be stored at a marina. Craft spending estimated in the same manner.

Table 8. Average Annual Total Craft Spending for Registered Boats Using Great Lakes ($ Millions)

Spending category	Not Marina					Marina				
	Less than 16'	16-20'	21-27'	28-40'	More than 40'	Less than 21'	21-28'	28-40'	More than 40'	Total
Slip	$2	$2	$1	$0	$0	$13	$78	$65	$17	$178
Yacht dues	$2	$6	$5	$3	$1	$2	$9	$9	$2	$40
Off season storage	$5	$9	$6	$2	$0	$2	$12	$14	$2	$53
Put in and haul out	$11	$10	$9	$3	$1	$1	$8	$10	$3	$56
Insurance	$30	$60	$34	$10	$4	$4	$21	$21	$7	$190
Repairs	$66	$130	$68	$17	$7	$8	$49	$42	$11	$398
Equipment	$117	$157	$85	$17	$3	$7	$47	$37	$9	$481
Taxes	$47	$13	$10	$3	$1	41	$4	$5	$2	$46
Total ($ Millions)	$242	$386	$218	$55	$18	$37	$228	$204	$53	$1,441

Table 9. Average Annual Economic Impact of Trip Spending for Boats Using the Great Lakes

Sector/Spending Category	Sales $ Millions	Jobs	Personal Income $ Millions	Value Added $ Millions
Direct Effects				
Lodging	$223	3,551	$97	$158
Marina services	$98	1,294	$36	$61
Restaurant	$407	10,524	$173	$195
Recreation/entertainment	$73	969	$27	$46
Repair/maintenance	$219	1,602	$43	$112
Food processing	$51	213	$9	$13
Marine supplies	$13	80	$3	$4
Petroleum Refining	$111	43	$5	$7
Retail Trade	$345	6,692	$164	$215
Wholesale Trade	$83	550	$32	$56
Other Local Production	$6	50	$2	$3
Total Direct Effects	$1,629	25,568	$592	$869
Secondary Effects	$1,401	12,720	$432	$401
Total Effects	$3,030	38,289	$1,023	$1,271
Multiplier	1.9	1.5	1.7	1.5

Note: See discussion after Table 6. Impacts estimated in the same way as for Tables 5 and 6, but based on spending Tables 7 and 8 covering only boats using the Great Lakes

Information obtained on the on-line last trip assessments revealed that overall, about 19 percent of registered watercraft in Great Lakes states use Great Lakes waters. The percentage is highest in Michigan (32%) due to the proximity of its populations to the Great Lakes. Based on the study, the size distribution of registered boats and geographic distribution of registered boat owners (i.e., distance from the Great Lakes), ten percent of registered boats in Indiana and Minnesota are estimated to use the Great Lakes.

For this analysis we assume craft and trip-related spending averages in Tables 1 and 2 apply to Great Lakes boaters. Great Lakes boat days are estimated by multiplying the number of boats using the Great Lakes by the average days of use for each segment (Table 35). An estimated 17 million boat days occurred on the Great Lakes and connecting waters in 2003, representing 18 percent of all boating in Great Lakes states[10]. Spending by registered boaters using the Great Lakes and connecting waters in 2003 generated $2.4 billion in trip-related spending (Table 7) and $1.4 billion in craft-related spending. The economic impacts of this spending are estimated in the same way as for all boater spending. Results are reported in Tables 9 (trip) and 10 (craft).

[10] Counting only Erie County in PA.

Table10. Average Annual Economic Impact of Craft Spending for Registered Boats Using the Great Lakes

Sector/Spending Category	Sales $ Millions	Jobs	Personal Income $ Millions	Value Added $ Millions
Direct Effects				
Slip	$178	2,361	$66	$111
Yacht dues	$40	523	$15	$25
Off season storage	$53	703	$20	$33
Put in and haul out	$56	747	$21	$35
Insurance	$190	1,658	$92	$165
Repairs	$398	2,912	$78	$204
Retail Trade	$200	3,877	$95	$125
Wholesale trade	$48	317	$18	$32
Local Manufacturer	$40	244	$10	$12
Total Direct Effects	$1,203	13,341	$416	$742
Secondary Effects	$897	8,638	$328	$33
Total Effects	$2,100	21,979	$ 744	$1,275
Multiplier	1.7	1.6	1.8	1.7

2.6 Impacts of Great Lakes Marinas

Results may be further narrowed to boats stored at Great Lakes marinas. The inventory of marinas serving the Great Lakes provides a reasonably firm estimate of the number of boats kept at Great Lakes marinas. The percentage of wet slips and moorings rented on a seasonal basis was determined from a study of marinas in zip codes adjacent to the Great Lakes. An overall basin-wide occupancy rate of 93 percent (Mahoney 2003 – low water study) was applied to estimate the number of boats in Great Lakes seasonal slips in each state (Table 30). Occupied slips were distributed to boat size classes so that spending could be estimated within the four marina boat size categories (Table 32).

AVERAGE ANNUAL SPENDING AND IMPACT OF REGISTERED WATERCRAFT KEPT AT GREAT LAKES MARINAS

Table 11. Total Trip Spending for Registered Boats Kept at Great Lakes Marinas ($ Millions)

Spending Category	Marina Segment				
	Less than 21'	21-27'	28-40'	More than 40'	Total
Lodging	$3.52	$38.30	$12.16	$2.51	$56.48
Marina services	$0.57	$13.52	$23.93	$6.62	$44.63
Restaurant	$6.97	$64.19	$42.52	$10.30	$123.98
Groceries	$5.33	$45.44	$29.00	$10.47	$90.24
Boat fuel	$9.08	$101.73	$50.39	$16.26	$177.46
Auto fuel	$5.22	$24.52	$7.36	$1.22	$38.32
Repair/maintenance	$4.32	$24.39	$11.66	$4.02	$44.37
Marine supplies	$3.68	$22.47	$12.30	$3.09	$41.53
Recreation/entertainment	$0.52	$11.88	$9.40	$1.58	$23.38
Shopping	$0.98	$11.91	$8.01	$3.31	$24.20
Total	$40.17	$358.33	$206.71	$59.37	$664.58

Table 12. Average Annual Total Craft Spending for Registered Boats Kept at Great Lakes Marinas ($ Millions)

Category	Marina Segment				
	Less than 21'	21-27'	28-40'	More than 40'	Total
Slip	$12.40	$82.22	$63.81	$16.69	$175.12
Yacht dues	$2.11	$9.00	$8.44	$2.39	$21.93
Off season storage	$1.56	$12.74	$13.73	$2.29	$30.31
Put in and haul out	$0.83	$8.49	$9.88	$2.69	$21.89
Insurance	$3.79	$21.67	$20.89	$6.80	$53.15
Repairs	$7.79	$51.67	$41.49	$10.71	$111.66
Equipment	$7.29	$49.84	$36.67	$8.81	$102.61
Taxes	$0.69	$3.81	$5.25	$2.40	$12.15
Total	$36.47	$239.43	$200.14	$52.7 7	$528.82

More than half of all boats kept at marinas in Great Lakes states are stored at marinas providing access to the Great Lakes and connecting waters. An estimated 107,000 boats were kept at Great Lakes marinas in 2003, the majority in Michigan and Ohio. These boats spent $665 million on trip-related expenses and $529 million on craft-related items. The economic impacts of this spending on the Great Lakes economy are reported in Tables 14 and 15.

Tables 20 and 21 summarize the boater spending and impact results for (1) all registered watercraft in the Great Lakes states, (2) all registered watercraft using the Great Lakes and (3) all boats kept at Great Lakes marinas. Boats using the Great Lakes account for about a fourth of all

registered boater spending in the Great Lakes states. Boats kept at Great Lakes marinas account for about thirty percent of spending by boats using the Great Lakes.

Table 13. Summary of Average Annual Craft and Trip Related Expenses for Registered Boats at Great Lakes Marinas

Spending Category	Marina Segment				
	Less than 21'	21-27'	28-40'	More than 40'	Total
Number of boats	14,176	63,271	28,152	4,705	110,304
Average days per boat	28.0	34.7	40.7	44.3	
Total boat days	397,494	2,193,170	1,146,916	208,216	3,945,797
Average spending per boat day	$101	$163	$180	$285	
Trip spending per boat per year	$2,834	$5,663	$7,343	$12,617	
Annual craft spending ($ per boat)	$2,573	$3,784	$7,109	$11,214	
Total spending per boat per year	$5,407	$9,448	$14,452	$23,832	
Total craft spending (in Millions)	$36	$239	$200	$53	$529
Total trip spending (in Millions)	$40	$358	$207	$59	$665
Total spending (in Millions)	$77	$598	$407	$112	$1,193
Pct of spending	6%	50%	34%	9%	100%

Table 14, Average Annual Economic Impact of Trip Spending for Registered Boats Kept at Great Lakes Marinas

Sector/Spending Category	Sales $ Millions	Jobs	Personal Income $ Millions	Value Added $ Millions
Direct Effects				
Lodging	$56.5	899	$24.6	$40.0
Marina services	$44.6	591	$16.6	$27.9
Restaurant	$124.0	3,206	$52.6	$59.3
Recreation/entertainment	$23.4	310	$8.7	$14.6
Repair/maintenance	$44.4	325	$8.7	$22.8
Food processing	$14.1	59	$2.4	$3.7
Marine supplies	$3.5	21	$0.9	$1.1
Petroleum refining	$30.0	12	$1.4	$1.8
Retail trade	$96.5	1,870	$46.0	$60.1
Wholesale trade	$23.2	153	$8.9	$15.6
Other local production	$2.6	21	$0.8	$1.2
Total Direct Effects	$462.7	7,467	$171.5	$248.0
Secondary Effects	$403.1	3,664	$124.6	$118.6
Total Effects	$865.7	11,130	$296.1	$366.6
Multiplier	1.9	1.5	1.7	1.5

Table 15. Average Annual Economic Impact of Craft Spending for Registered Boats at Kept Great Lakes Marinas

Sector/Spending Category	Sales $ Millions	Jobs	Personal Income $ Millions	Value Added $ Millions
Direct Effects				
Slip	$175	2,319	$65	$109
Yacht dues	$22	290	$8	$14
Off season storage	$30	401	$11	$19
Put in and haul out	$22	290	$8	$14
Insurance	$53	464	$26	$46
Repairs	$112	817	$22	$57
Retail Trade	$43	827	$20	$27
Wholesale trade	$10	68	$4	$7
Local Manufacturer	$9	52	$2	$3
Total Direct Effects	$476	5,529	$167	$295
Secondary Effects	$363	3,522	$133	$216
Total Effects	$839	9,051	$300	$512
Multiplier	1.8	1.6	1.8	1.7

2.7 State Level Impacts

Economic impacts can also be estimated for individual states. This analysis does not take into account some cross-state travel by boats registered in a different state than where the boat is used. State level impacts are estimated using a different input-output model for each state. The sum of impacts across states will be somewhat less than the previous basin-wide impact results as state level multipliers are lower than basin-wide multipliers. There are also some variations in job to sales ratios across states that affect the job estimates.

The following tables summarize impacts on state economies. For these tables total trip and craft spending for boats registered in each state are applied to input-output models for each state. The sum of Great Lakes state totals will differ some from the impacts reported for singular Great Lakes states as job to sales ratios vary somewhat from state to state and multipliers for individual states are smaller than for the eight Great Lakes states as a whole. For Pennsylvania, spending only covers boats registered in Erie County and impacts are on the Erie County economy, not statewide.

Table 16. Average Annual Direct Economic Impact of Registered Boats on State Economies

	Sales $ Millions	Jobs	Personal Income $ Millions	Value Added $ Millions
Trip Spending				
Illinois	$662	9,887	$242	$356
Indiana	$825	14,654	$288	$428
Michigan	$1,421	24,582	$515	$760
Minnesota	$1,315	23,257	$465	$689
New York	$945	12,852	$358	$524
Ohio	$709	11,830	$253	$374
Erie County (PA)	$30	578	$10	$15
Wisconsin	$932	17,770	$326	$484
Total Trip Spending	$6,838	115,411	$2,457	$3,629
Annual Craft Spending				
Illinois	$447	4,774	$154	$275
Indiana	$539	6,621	$181	$322
Michigan	$985	11,288	$341	$607
Minnesota	$834	10,115	$283	$506
New York	$706	6,910	$247	$440
Ohio	$510	6,291	$175	$311
Erie County (PA)	$20	317	$7	$12
Wisconsin	$606	8,165	$204	$364
Total Craft Spending	$4,647	54,481	$1,590	$2,837
Trip and Craft Spending				
Illinois	$1,109	14,661	$396	$631
Indiana	$1,364	21,275	$469	$750
Michigan	$2,406	35,870	$856	$1,367
Minnesota	$2,149	33,372	$748	$1,195
New York	$1,651	19,762	$605	$964
Ohio	$1,219	18,121	$428	$685
Erie County (PA)	$50	895	$17	$27
Wisconsin	$1,538	25,935	$530	$848
Total	$11,486	169,891	$4,049	$6,467

Table 17. Total Average Annual Economic Impact (Direct and Secondary) of Registered Boats on State Economies

	Sales $ Millions	Jobs	Personal Income $ Millions	Value Added $ Millions
Trip Spending				
Illinois	$1,195	14,644	$408	$501
Indiana	$1,357	20,362	$435	$542
Michigan	$2,362	34,064	$796	$975
Minnesota	$2,325	33,201	$765	$946
New York	$1,605	18,246	$572	$705
Ohio	$1,166	16,645	$382	$467
Erie County (PA)	$42	759	$14	$17
Wisconsin	$1,540	24,470	$500	$616
Total Trip Spending	$11,592	162,391	$3,873	$4,769
Annual Craft Spending				
Illinois	$763	7,762	$270	$462
Indiana	$846	10,075	$284	$494
Michigan	$1,543	17,265	$546	$937
Minnesota	$1,384	15,859	$481	$829
New York	$1,144	10,655	$416	$713
Ohio	$793	9,503	$274	$473
Erie County (PA)	$29	436	$10	$17
Wisconsin	$953	12,170	$325	$560
Total Craft Spending	$7,455	83,725	$2,605	$4,486
Trip and Craft Spending				
Illinois	$1,958	22,407	$678	$963
Indiana	$2,203	30,437	$719	$1,036
Michigan	$3,905	51,329	$1,342	$1,913
Minnesota	$3,709	49,060	$1,247	$1,775
New York	$2,749	28,901	$987	$1,418
Ohio	$1,959	26,148	$656	$939
Erie County (PA)	$71	1,195	$24	$34
Wisconsin	$2,493	36,640	$825	$1,177
Total	$19,047	246,117	$6,479	$9,255

Table 18. Direct Average Annual Economic Impacts of Boats Using the Great Lakes by State of Registration

	Sales $ Millions	Jobs	Personal Income $ Millions	Value Added $ Millions
Trip Spending				
Illinois	$135	2,037	$50	$73
Indiana	$113	1,981	$39	$58
Michigan	$561	9,714	$204	$300
Minnesota	$161	2,850	$57	$84
New York	$188	2,563	$71	$104
Ohio	$200	3,382	$72	$105
Erie County (PA)	$21	405	$7	$10
Wisconsin	$250	4,768	$87	$129
Total Trip Spending	$1,629	27,701	$588	$865
Annual Craft Spending				
Illinois	$105	1,128	$36	$65
Indiana	$75	896	$25	$45
Michigan	$431	5,027	$150	$267
Minnesota	$100	1,209	$34	$61
New York	$141	1,373	$49	$88
Ohio	$170	2,197	$59	$104
Erie County (PA)	$14	229	$5	$9
Wisconsin	$166	2,296	$56	$100
Total Craft Spending	$1,203	14,355	$414	$739
Trip and Craft Spending				
Illinois	$240	3,166	$86	$138
Indiana	$188	2,877	$65	$104
Michigan	$992	14,741	$354	$566
Minnesota	$262	4,059	$91	$145
New York	$329	3,936	$121	$192
Ohio	$370	5,578	$131	$210
Erie County (PA)	$35	634	$12	$19
Wisconsin	$416	7,064	$143	$230
Total	$2,832	42,055	$1,002	$1,604

Table 19. Total Average Annual Economic Impact of Boats Using the Great Lakes by State of Registration

	Sales $ Millions	Jobs	Personal Income $ Millions	Value Added $ Millions
Trip Spending				
Illinois	$245	3,017	$84	$103
Indiana	$186	2,765	$60	$74
Michigan	$934	13,473	$316	$386
Minnesota	$286	4,074	$94	$115
New York	$320	3,638	$114	$140
Ohio	$329	4,749	$109	$132
Erie County (PA)	$29	531	$10	$12
Wisconsin	$413	6,570	$134	$165
Total Trip Spending	$2,742	38,817	$920	$1,126
Annual Craft Spending				
Illinois	$180	1,839	$64	$109
Indiana	$118	1,377	$40	$69
Michigan	$677	7,673	$240	$412
Minnesota	$166	1,895	$58	$100
New York	$228	2,119	$83	$142
Ohio	$266	3,293	$92	$159
Erie County (PA)	$21	314	$7	$12
Wisconsin	$262	3,399	$89	$154
Total Craft Spending	$1,917	21,908	$672	$1,158
Trip and Craft Spending				
Illinois	$425	4,856	$148	$212
Indiana	$304	4,143	$99	$143
Michigan	$1,611	21,146	$556	$798
Minnesota	$452	5,970	$151	$215
New York	$548	5,758	$197	$282
Ohio	$595	8,041	$201	$291
Erie County (PA)	$50	845	$17	$24
Wisconsin	$675	9,968	$224	$319
Total	$4,659	60,726	$1,592	$2,284

Table 20. Summary of Average Annual Spending by Registered Boats in the Great Lakes States ($ Millions)

Spending Category	All Registered Boats	All Boats Using Great Lakes	All Boats at Great Lakes Marinas	Pct Great Lakes	Pct of GL by Boats at Marinas
Trip Spending					
Lodging	$1,031	$223	$56	22%	25%
Marina services	$310	$98	$45	32%	46%
Restaurant	$1,679	$407	$124	24%	30%
Groceries	$1,392	$324	$90	23%	28%
Boat fuel	$2,177	$556	$177	26%	32%
Auto fuel	$1,181	$240	$38	20%	16%
Repair/maintenance	$987	$219	$44	22%	20%
Marine supplies	$655	$157	$42	24%	26%
Recreation/entertainment	$278	$73	$23	26%	32%
Shopping	$206	$59	$24	29%	41%
Trip Total	$9,895	$2,357	$665	24%	28%
Craft Spending					
Slip	$346	$178	$175	52%	98%
Yacht dues	$117	$40	$22	34%	56%
Off season storage	$167	$53	$30	32%	57%
Put in and haul out	$216	$56	$22	26%	39%
Insurance	$787	$190	$53	24%	28%
Repairs	$1,676	$398	$112	24%	28%
Equipment	$2,236	$481	$103	22%	21%
Taxes	$187	$46	$12	24%	27%
Craft Total	$5,731	$1,441	$529	25%	37%
Trip and Craft Spending					
Total	$15,626	$3,798	$1,193	24%	31%

Table 21. Summary of Average Annual Economic Impact of Boater Spending on the Great Lakes States Economy

	All Registered Boats	All Boats Using Great Lakes	All Boats at Great Lakes Marinas
Direct Effects			
Trip Spending			
Sales ($ Millions)	$6,838	$1,629	$463
Jobs	106,728	25,568	7,467
Personal Income ($ Millions)	$2,474	$592	$172
Value Added ($ Millions)	$3,652	$869	$248
Craft Spending			
Sales ($ Millions)	$4,647	$1,203	$476
Jobs	50,955	13,341	5,529
Personal Income ($ Millions)	$1,600	$416	$167
Value Added ($ Millions)	$2,855	$742	$295
Total Direct Effects (Trip and Craft)			
Sales ($ Millions)	$11,485	$2,832	$938
Jobs	157,683	38,909	12,996
Personal Income ($ Millions)	$4,074	$1,007	$338
Value Added ($ Millions)	$6,507	$1,612	$543
Total Effects (Direct, Indirect and Induced)			
Trip Spending			
Sales ($ Millions)	$12,696	$3,030	$866
Jobs	159,884	38,289	11,130
Personal Income ($ Millions)	$4,277	$1,023	$296
Value Added ($ Millions)	$5,330	$1,271	$367
Craft Spending			
Sales ($ Millions)	$8,095	$2,100	$839
Jobs	84,051	21,979	9,051
Personal Income ($ Millions)	$2,861	$744	$300
Value Added ($ Millions)	$4,902	$1,275	$512
Total Effects (Trip and Craft)			
Sales ($ Millions)	$20,791	$5,131	$1,705
Jobs	243,935	60,267	20,182
Personal Income ($ Millions)	$7,138	$1,767	$596
Value Added ($ Millions)	$10,232	$2,546	$878

Note: Impacts estimated by applying spending to an input-output model of the Great Lakes States economy (7 states and Erie County, PA).

3. Numbers and Types of Registered Boats in the Great Lakes States

Boat registrations continue to be the primary source for determining numbers of recreational boaters in the Great Lakes. The Motor Boat Safety Act of 1958, amended in 1971 (USC 46, Ch. 123), requires states to register recreational vessels for boating safety and law enforcement purposes, and it authorizes the U.S. Coast Guard to annually track numbered recreational vessels for the purpose of allocating funds related to federally approved state boating safety programs. Fees associated with state boat registration also provide revenues to support the administration and maintenance of state boating and other recreational infrastructure.

3.1 Methodology

A consistent count of recreational boats in the Great Lakes states can be confounded by differences between the "numbering" and "registering" processes for recreational vessels. As noted above, the U.S. Motor Boat Safety Act authorizes the U.S. Coast Guard to annually track numbered recreational vessels for boating safety and law enforcement purposes, including the allocation of funds related to federally approved state boating safety programs. According to 33CFR, Section 173.11, numbering "applies to vessels equipped with propulsion machinery of any type used on waters subject to the jurisdiction of the United States."

Therefore, as mandated by 33CFR, the Coast Guard is only required to number and count recreational boats that are mechanically propelled. Individual states, on the other hand, may register non-motorized vessels as well. Whether these non-motorized craft are also numbered is a matter of state, rather than Coast Guard, administration. Thus, while all motorized craft must by law be numbered and registered, the particular mix of numbered versus registered boats varies from state to state. In short, all numbered vessels must be registered, but not all registered vessels must be numbered.

"Documented vessels" present a minor exception to this rule, but one that is worth noting nonetheless. Documented vessels are large boats (over five net tons; greater than 26 feet in length) that some people choose to register at the federal level through the Coast Guard. The reasons for federal documentation may vary but it is typically done to leave a paper trail of modifications made to the boat, for greater ease of tracking the vessel should it be stolen, and for establishing the basis for securing a lien for improvement loans through financial institutions.

Documented boats are not required by federal law to also be registered by the state of its principal use, but some states – for example, Ohio – do require it if the boat's documented purposed is primarily recreational. In any case, the Coast Guard does not require documented vessels to be listed on its annual state reports, so an individual state may or may not include this information on its annual report even if it does also register its documented vessels. As one boating expert noted, the number of documented vessels in any one Great Lakes state is so small as to be statistically insignificant to its overall count of recreational vessels.

Documented vessels aside, differences between vessel numbering and registration present an inconsistent measure of recreational boats across the Great Lakes states. The state of New York requires neither numbering nor registration of non-motorized rowboats, canoes, and kayaks;

Minnesota, on the other hand, registers and numbers all recreational vessels except non-motorized vessels under nine feet in length, documented vessels, seaplanes, rice boats and duck boats.

Similar kinds of contrasts may be drawn among all the Great Lakes states. Given these differences among the states' registration protocols, and given the need to establish a consistent basis for counting recreational vessels across the Great Lakes states, this study uses numbers provided on each state's annual Coast Guard reports as a starting point. Although discrepancies exist among the numbers reported by the jurisdictions, in the absence of other regionwide protocol, the Coast Guard numbers reflect the most consistently applied and, for this point-in-time, most accurate data obtainable for the regional entity.

3.2 Double Counting of Recreational Vessels

The potential for "double counting" some recreational vessels can influence the overall number of recreational vessels reported for the Great Lakes states. Double counting refers to instances in which the same boat is counted more than once in the annual Coast Guard reports. The degree to which this actually occurs throughout the states, if at all, is not known. Some recreational boating experts suggest that the potential certainly exists for some double counting to occur, while others – for example, the Coast Guard statistician – counter that, regardless of whether the potential exists, any such errors would be corrected through numerous statistical checks and verification at the federal level.

The two most likely ways for a double count to occur include (1) overlap in registration between a boat currently registered to one state even after having been re-registered to a new state of principal use, and (2) boats that receive dual classification on Coast Guard reports. In the first example, double counting might occur if a boat remained registered in one state (for instance, in Michigan where registrations must be renewed every three years to remain active), but after one year the boat owner moved and re-registered the vessel to a new state of principal use. In this case, the question with respect to double counting is this: would the boat appear on both states' annual Coast Guard report until the expiration date had been reached for the first state?

According to 33CFR, Part 173.17, "when a vessel is removed to a new state of principal operation, the issuing authority of that state shall recognize the validity of the number issued by the original state for 60 days." Part 173.77 goes on to state that "a certificate of number is invalid 60 days after the day on which the vessel is no longer principally used in the state where the certificate was issued." According to one state's boating administrator, double counting would not occur in such cases because one state's registration automatically nullifies the previous state's. Other recreational boating experts, though, express reservations regarding whether the initial state actually removes the registration from their files at that time, or if it is left "inactive" until the expiration date has passed. In this latter case a potential double count would occur. Regional data do not exist on this issue, so it is difficult to estimate the extent to which this kind of double counting actually occurs throughout the Great Lakes states. Future estimates of the number of recreational boats in the Great Lakes states will have to account for this potential double count.

In the second example, double counting might occur due to multiple classifications of the same vessel on the annual Coast Guard report. According to one state's boating administrator, this is most likely to occur with respect to personal watercraft (PWC). The Coast Guard form used to tally each state's registered boats includes a section titled "other boats," including categories for rowboats, canoes, kayaks, non-mechanically powered sailboats and PWC. PWCs are motorized vessels and therefore are subject to numbering and registration requirements of 33CFR. Some states – Pennsylvania, for instance – choose to collapse their PWCs into the "under 16 feet/sterndrive" category of their annual Coast Guard reports.

It is possible that when registering their boats some individual PWC owners may have already classified their PWCs as "under 16 foot/sterndrive" vessels, in which case those boats could potentially be double counted. As noted previously, though, the Coast Guard statistician disagrees that such double counting occurs to any great extent. His office seeks to identify such errors through statistical verification, and to the best of his knowledge, double counting has not been a significant problem.

3.3 Summary

According to the U.S. Coast Guard, there are almost 4.3 million recreational boats in the eight Great Lakes states. This comprises a third of all numbered U.S. recreational vessels, and represents a 1.3 percent increase over the five-year period between 1999 and 2003.

Nearly one-quarter of all recreational boats in the Great Lakes states belong to people residing in Great Lakes shoreline counties. Michigan, with its considerable Great Lakes coastline, leads the Great Lakes states with nearly one million recreational boats, 42 percent of which belong to people residing in its coastal counties. Indiana has the fewest recreational boats overall (216,145), while only 3 percent of Pennsylvania's recreational boats belong to people residing in Erie County, its one Great Lakes coastal county.

Table 22. Watercraft Registration Trends in Great Lakes States

Great Lakes States	Registered Boats					
	# of Boats 2003	# of Boats 2002	# of Boats 2001	# of Boats 2000	# of Boats 1999	% Change (1999 to 2003)
Illinois	360,252	398,431	369,626	372,162	372,618	-3.3%
Indiana	216,145	218,363	218,255	219,189	229,778	-5.9%
Michigan	953,554	1,000,337	1,003,947	1,000,049	985,732	-3.3%
Minnesota	845,379	834,974	826,048	812,247	793,107	6.6%
New York	528,094	529,732	526,190	525,436	524,326	0.7%
Ohio	413,048	413,276	414,658	416,798	407,347	1.4%
Pennsylvania	355,235	357,729	359,525	359,360	352,231	0.9%
Wisconsin	610,800	619,124	575,920	573,920	562,788	8.5%
All Great Lakes States	4,282,507	4,371,966	4,294,169	4,279,161	4,227,927	1.3%
All Other States	8,414,500	8,414,476	8,517,638	8,439,109	8,457,924	-0.5%

Source: National Marine Manufacturers Association developed from information provided by the U.S. Coast Guard.

Five of the Great Lakes states have seen recreational boater numbers increase or remain stable. Wisconsin and Minnesota experienced the strongest growth with 8.5 percent and 6.6 percent respectively. However, three states (Indiana, Michigan and Illinois) experienced declining boat registrations in recent years, likely to slowing economies in the Upper Midwest.

Figure 3.3.1. Number of Boats by Great Lakes State in 2003

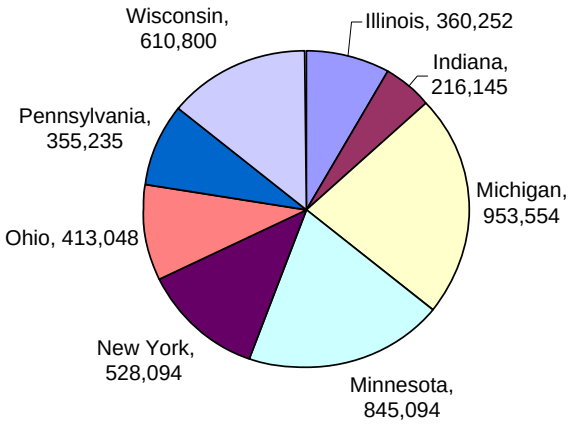


Figure 3.3.2. Number of Boats in 2003

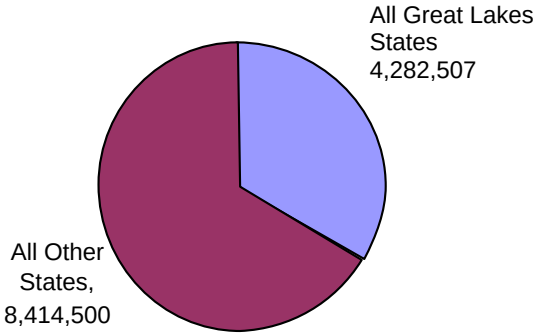


Table 23. Number of Currently Registered Watercraft by State of Registration and Boat Length, 2003 [a]

State where Boats are Registered									
Length in Feet	**IL**	**IN**	**MI**	**MN**	**NY**	**OH**	**Erie County (PA)**	**WI**	**Total**
Less than 12’	56,833 14.4%	84,892 15.1%	136,020 16.4%	64,830 7.5%	78,077 16.3%	78,981 19.0%	2,499 14.3%	47,325 7.7%	549,457
12 -15’	110,891 28.0%	227,383 40.6%	263,579 31.7%	282,099 32.7%	115,883 24.3%	117,100 28.2%	6,552 37.5%	260,904 42.7%	1,384,391
16 – 20’	178,195 45.1%	197,952 35.3%	297,002 35.7%	463,119 53.6%	168,463 35.3%	155,315 37.4%	5,536 31.7%	244,924 40.1%	1,710,506
21 – 27’	38,340 9.7%	43,675 7.8%	106,097 12.8%	47,349 5.5%	85,965 18.0%	51,555 12.4%	2,176 12.4%	49,820 8.1%	424,977
28 – 40’	9,740 2.5%	5,811 1.0%	25,325 3.0%	5,273 0.6%	27,040 5.7%	11,367 2.7%	674 3.9%	7,500 1.2%	92,730
More than 40’	1,525 0.4%	847 0.2%	2,908 0.3%	654 0.1%	2,362 0.5%	859 0.2%	46 0.3%	835 0.1%	10,036
Total [b]	395,524 9.5%	560,560 13.4%	830,931 19.9%	863,324 20.7%	477,790 11.5%	415,177 10.0%	17,483 0.4%	611,308 14.7%	4,172,097 100%

[a] Data used to develop this table was provided by Infolink. These are boats that were registered to operate in July 2003.
[b] The number of currently registered watercraft. The numbers differ from the U.S. Coast Guard reported registrations because of differences when the data was compiled and the bases for reporting the number of registered boats.

Table 24. Number of Watercraft by State of Registration and Boat Type, 2003

State where Boats are Registered									
Boat Type	**IL**	**IN**	**MI**	**MN**	**NY**	**OH**	**Erie County (PA)**	**WI**	**Total**
Aluminum power < 16	62,296 15.8%	131,698 23.5%	168,419 20.3%	187,657 21.7%	67,043 14.0%	57,110 13.8%	3,242 18.5%	191,743 31.4%	869,208
Aluminum fishing 16'-24'	70,524 17.8%	47,940 8.6%	80,580 9.7%	205,190 23.8%	39,740 8.3%	40,830 9.8%	1,407 8.0%	119,648 19.6%	605,859
Aluminum fishing 25'-29'	128 0%	373 0.1%	318 0%	82 0%	412 0.1%	772 0.2%	39 0.2%	396 0.1%	2,520
Pontoon	32,101 8.1%	52,900 9.4%	140,730 16.9%	70,501 8.2%	11,074 2.3%	16,897 4.1%	175 1.0%	57,108 9.3%	381,486
Fiberglass power <16	18,598 4.7%	58,186 10.4%	38,703 4.7%	36,107 4.2%	28,562 6.0%	23,618 5.7%	1,443 8.3%	48,235 7.9%	253452
Fiberglass runabout 16'-24'	90,312 22.8%	127,943 22.8%	170,590 20.5%	109,544 12.7%	163,647 34.3%	106,807 25.7%	3,981 22.8%	99,007 16.2%	871,831
Fiberglass yacht 30' +	5,535 1.4%	2,667 0.5%	15,258 1.8%	2,847 0.3%	15,574 3.3%	6,170 1.5%	359 2.1%	3,667 0.6%	52077
Fiberglass Cruiser 25'-29'	7,256 1.8%	4,596 0.8%	18,767 2.3%	5,222 0.6%	25,939 5.4%	12,285 3.0%	532 3.0%	4,844 0.8%	79,441
Canoe/kayak/self -Propelled	40,033 10.1%	34,066 6.1%	9,176 1.1%	169,056 19.6%	15,109 3.2%	76,385 18.4%	3,557 20.3%	17,012 2.8%	364394
Personal Water Craft	33,586 8.5%	39,071 7.0%	104,842 12.6%	41,901 4.9%	54,717 11.5%	42,189 10.2%	1,272 7.3%	34,673 5.7%	352,251
Sail	11,194 2.8%	9,159 1.6%	32,542 3.9%	17,829 2.1%	14,655 3.1%	11,819 2.8%	659 3.8%	13,500 2.2%	111,357
Inflatable	3,449 0.9%	2,158 0.4%	15,701 1.9%	4,157 0.5%	11,914 2.5%	7,139 1.7%	265 1.5%	4,004 0.7%	48,787
Jet boat	1,870 0.5%	1,537 0.3%	9,474 1.1%	2,509 0.3%	3,560 0.7%	3,496 0.8%	61 0.3%	3,109 0.5%	25,616
Ski	3,269 0.8%	8,008 1.4%	12,346 1.5%	4,653 0.5%	2,602 0.5%	3,699 0.9%	63 0.4%	6,023 1.0%	40,663
All other	15,373 3.9%	40,258 7.2%	13,485 1.6%	6,069 0.7%	23,242 4.9%	5,961 1.4%	428 2.4%	8,339 1.4%	113,155
Total	395,524 9.5%	560,560 13.4%	830,931 19.9%	863,324 20.7%	477,790 11.5%	415,177 10.0%	17,483 0.4%	611,308 14.7%	4,172,097 100%

Table 25. Number of Watercraft Currently Registered to Residents of Great Lakes Counties in Great Lakes States, 2003

State where Boats are Registered									
Length in Feet	**IL**	**IN**	**MI**	**MN**	**NY**	**OH**	**Erie County (PA)**	**WI**	**Total**
Less than 12’	14,497 17.3%	7,058 13.6%	58,291 16.7%	1,101 1.7%	15,754 15.2%	16,295 20.6%	2,398 13.8%	15,087 9.3%	130,481
12 – 15’	19,683 23.5%	19,219 37.2%	106,578 30.5%	24,301 38.2%	27,842 26.8%	18,368 23.2%	6,552 37.7%	68,548 42.3%	291,091
16 – 20’	33,639 40.1%	19,075 36.9%	119,569 34.2%	35,449 55.7%	40,965 39.5%	24,922 31.5%	5,536 31.8%	61,481 37.9%	340,636
21 – 27’	10,899 13.0%	4,879 9.4%	48,197 13.8%	2,524 4.0%	14,930 14.4%	14,246 18.0%	2,176 12.5%	13,577 8.4%	114,428
28 – 40’	4,509 5.4%	1,334 2.6%	14,909 4.3%	230 0.4%	4,039 3.9%	5,126 6.5%	674 3.9%	3,136 1.9%	33,957
More than 40’	695 0.8%	146 0.3%	1,582 0.5%	21 0%	239 0.2%	284 0.4%	46 0.3%	342 0.2%	3,355
Total	83,922 9.2%	51,711 5.7%	349,126 38.3%	63,626 7.0%	103,769 11.4%	79,241 8.7%	17,382 1.9%	162,171 17.8%	910,948 100%

Table 26. Number of Watercraft Currently Registered to Residents of Non-Great Lakes States, 2003

State where Boats are Registered									
Length in Feet	**IL**	**IN**	**MI**	**MN**	**NY**	**OH**	**Erie County (PA)**	**WI**	**Total**
Less than 12’	607 12.7%	524 13.6%	1779 15.2%	1456 4.8%	2156 13.0%	904 17.6%	- -	639 8.7%	8,065
12 – 15’	1,117 23.3%	1,196 31.0%	3756 32.1%	9,526 31.3%	4,020 24.3%	1,202 23.4%	- -	3,025 41.2%	23,842
16 – 20’	1,981 41.4%	1,504 39%	4052 34.6%	16,882 55.4%	5,912 35.7%	1,842 35.9%	- -	2,595 35.4%	34,768
21 – 27’	737 15.4%	510 13.2%	1586 13.5%	2,401 7.9%	3,292 19.9%	845 16.4%	- -	868 11.8%	10,239
28 – 40’	286 6.0%	99 2.6%	451 3.9%	173 0.6%	1,062 6.4%	309 6.0%	- -	179 2.4%	2,559
More than 40’	57 1.2%	25 0.6%	85 0.7%	32 0.1%	106 0.6%	36 0.7%	- -	34 0.5%	375
Total	4,785 6.0%	3,858 4.8%	11,709 14.7%	30,470 38.2%	16,548 20.7%	5,138 6.4%	- -	7,340 9.2%	79,848 100%

Table 27. Number of Watercraft by State of Residence and Registration

State of Boat Registration	State of Residence								
	MI	IN	IL	MN	NY	OH	Erie County (PA)	WI	Non-Great Lake State
Illinois	257	555	389,031	96	35	72	0	688	4,790
Indiana	1,083	543,193	5,075	35	32	7,150	0	86	3,906
Michigan	784,293	10,817	11,264	179	231	11,462	0	974	11,709
Minnesota	675	1,287	2,936	819,499	240	511	0	5,563	32,613
New York	194	80	124	91	459,536	1,165	0	34	16,566
Ohio	657	596	137	38	92	408,406	0	54	5,197
Erie County, PA	0	0	0	0	27	1	17,455	0	0
Wisconsin	719	862	34,359	13,795	99	389	0	553,744	7,341
Total	787,878	557,390	442,926	833,733	460,292	429,156	17,455	561,143	82,122

Table 28. Registered Watercraft by Segment and State of Registration

Segment	State of Registration								Total
	IL	IN	MI	MN	NY	OH	Erie County (PA)	WI	
Non-Marina Boats									
Less than 16’	166,928	311,698	397,372	346,285	190,553	193,435	9,016	307,780	1,923,066
16-20’	176,687	197,238	294,057	461,595	158,599	148,049	5,499	244,186	1,685,909
21-27’	31,784	41,220	83,374	44,721	53,558	27,894	1,915	46,547	331,013
28-40’	2,664	2,758	5,037	2,674	3,650	2,101	271	3,937	23,092
More than 40’	274	537	284	437	950	423	17	517	3,439
Boats in Marinas									
Less than 20’	2,358	1,453	5,238	2,325	13,347	10,415	72	1,704	36,912
21-27’	8,746	4,395	27,835	4,283	38,156	26,393	388	5,179	115,375
28-40’	4,892	1,121	15,185	950	17,665	6,598	276	1,690	48,377
More than 40’	1,251	310	2,624	218	1,413	440	29	318	6,603
Total	395,584	560,730	831,006	863,487	477,890	415,748	17,483	611,858	4,173,786

4. Marinas' Contribution to Recreational Boating Economic Benefits

Marinas serving Great Lakes boaters are obviously key generators of economic benefit to the region. These facilities are where a good share of boater spending takes place, where many jobs are supported and where much investment takes place by both the public and private sectors. To quantify the economic impact of Great Lakes marinas and better understand the importance of this marine sector, information was needed on the number of marina slips on the Lakes, including seasonal rental slips. It was also necessary to estimate and verify the number of registered boats kept in marinas.

4.1 Methodology

A listing of marinas in Great Lakes states was assembled from various sources including: (1) a national list of permitted marinas compiled by Marine Operators Association, (2) lists of marinas developed for a study of the impacts of low water on Lake Michigan marinas and (3) a 2002 study of marinas and yacht clubs operating in 2002 along Lake Ontario and the St. Lawrence River. The New York research conducted by Cornell University conducted evaluations of 194 (94 percent of total) marinas and yacht clubs. The assessments documented services provided by each marina and yacht club and gathered GPS readings.

These different lists were compiled into a data base of marinas in Great Lakes counties and also marinas located in Great Lakes adjacent zip code areas. A concern with the marina data was that many of the base lists were formed based on marina permits and previous inventories, some of which were up to five years old.

Recognizing this, a process was established to verify marinas in Great Lakes adjacent zip code areas that included: (1) identifying marina web sites and (2) searching electronic and yellow pages for marina listings. All marinas for which a telephone number could be identified were telephoned to verify that they were currently in operation, to ascertain the current total number of slips and number of seasonal slips available, and whether they also offered moorings.

Since New York marinas had been verified in 2002, that set was not verified again. Marinas for which there was an address but no telephone number were sent mail-delivered evaluations to verify they were still in business. There was not sufficient time or financial resources to verify all marinas in Great Lake bordering counties. However, a high percentage of these are located in Great Lakes adjacent zip codes.

4.2 Summary

It is estimated that there are more than a quarter million marina slips available in Great Lakes states. About half (51 percent) of these slips are located in Great Lakes bordering counties. Most (89 percent) are seasonal rental slips. It is estimated that there are approximately 115,000 seasonal rental slips in Great Lakes bordering county marinas, boatyards, condominium and dockominium marinas, and yacht clubs.

Table 29. Number of Marina Slips in Great Lakes States

State	Number of Slips		Percent		Seasonal Slips			Occupied seasonal slips	
	Statewide	GL Slips	GL	Pct Seasonal Slips	Statewide	GL Slips	Occ. Rate	Statewide	GL Slips
Illinois	19,118	8,487	44%	97%	18,544	8,232	93%	17,246	7,656
Indiana	9,101	2,883	32%	86%	7,827	2,479	93%	7,279	2,306
Michigan	64,368	54,056	84%	85%	54,713	45,948	93%	50,883	42,731
Minnesota	8,990	607	7%	93%	8,361	565	93%	7,775	525
New York	83,491	18,047	22%	91%	75,977	16,423	93%	70,658	15,273
Ohio	55,646	39,915	72%	85%	47,299	33,928	93%	43,988	31,553
Erie County (PA)	10,378	3,224	31%	90%	9,340	2,902	93%	8,686	2,698
Wisconsin	11,247	8,287	74%	85%	9,560	7,044	93%	8,891	6,551
Total	262,339	135,506[a]	52%	88%	231,621	117,520	93%	215,407	109,294

[a]Slips in marinas in Great Lakes counties. This includes slips in Great Lakes adjacent zip codes.

Based on previous Great Lakes marina studies and discussions during the summer of 2004 with over 800 Great Lakes marina owners and operators, it was estimated that an average of 93 percent of the accessible seasonal slips in Great Lakes counties were occupied the summer of 2004. That means that about 107,000 boats were kept in Great Lakes county marinas during the boating season.

The verification process identified 1,192 facilities in Great Lakes adjacent zip codes that provide wet slips for boats. About 68 percent are marinas, 12 percent are yacht clubs, 11 percent are boatyards and campgrounds, and 9 percent are either condominiums or dockominiums.

Eighty-two percent of the estimated 116,916 slips in these facilities marinas were verified. About 87 percent (101,500) of all slips in Great Lakes adjacent zip codes marinas are seasonal or condominium slips. This proportion is comparable to that in all Great Lakes county marinas. Nearly 45 percent of these facilities provide transient slips.

The verification process determined that about 3 percent of the marinas identified on various lists used to compile the database are no longer in operation, have been purchased and combined with other marinas, or were never developed even though a permit was issued. Some of these marinas have been converted to other uses including residential and commercial development. This, combined with continuing affects of low water levels and reduced dredging, is reducing the number of available and accessible Great Lakes marina slips. Occupancy rates are increasing and in some locations it is more difficult and expensive to rent or purchase a slip.

Table 30. Number of Marinas and Marina Slips in Great Lakes Adjacent Zip Codes

Marinas in Zip Codes Adjacent to Great Lakes					
	Marina Facilities				
State	**Marina**	**Yacht Club**	**Boatyard**	**Campground**	**Condominium**
Illinois	7	0	1	0	0
Indiana	13	2	0	0	1
Michigan	436	58	33	36	79
Minnesota	4	0	0	0	0
New York	119	26	23	12	1
Ohio	176	47	5	21	26
Erie County (PA)	17	4	2	0	0
Wisconsin	53	7	0	3	0
Totals	825	144	64	72	107

	Slip Information					
States	**Total Slips**	**Verified Slips[a]**	**Seasonal Slips (Y/N)[b]**	**Seasonal Slips (#)[c]**	**Transient Slips[d]**	**Moorings[e]**
Illinois	5,900	5,884	6	5,744	5	1
Indiana	2,883	2,371	12	2,482	6	1
Michigan	49,271	36,411	343	41,922	241	52
Minnesota	276	276	4	258	4	1
New York	15,787	15,531	160	14,530	110	14
Ohio	35,367	28,552	154	30,000	129	4
Erie County (PA)	3,224	3,224	2	2,058	2	2
Wisconsin	6,683	5,936	47	5,871	46	5
Totals	119,391	98,185	728	100,807	543	80

[a]These slips were verified with contacts at the marinas.
[b]It was verified these marinas have seasonal slips.
[c]Estimated number of seasonal slips includes those marinas that were not verified.
[d]It was verified these marinas have transient slips.
[e]It was verified these marinas have moorings.

Table 31. Number of Registered Boats Kept at Marinas by State of Registration and Size

Length in Feet	State of Registration								Total
	IL	IN	MI	MN	NY	OH	Erie County (PA)	WI	
Less than 12’	245	164	679	113	628	738	53	95	2,716
12-15’	574	526	1,579	592	2,826	2,199	294	627	9,218
16-20’	1,538	763	2,966	1,619	9,892	7,478	802	982	26,040
21-27’	8,746	4,395	27,758	4,283	38,156	26,393	1,202	5,179	116,112
28-40	4,892	1,121	15,143	950	17,665	6,598	321	1,690	48,379
More than 40’	1,251	310	2,617	218	1,413	440	27	318	6,593
Total	17,246	7,279	50,742	7,775	70,580	43,846	2,698	8,891	209,058

Table 32. Registered Boats in Great Lakes Marinas by Length and State of Registration

Length in Feet	State of Registration								Total
	IL	IN	MI	MN	NY	OH	Erie County (PA)	WI	
Less than 12’	25	25	340	6	63	295	53	38	845
12-15’	57	79	950	30	283	880	294	251	2,823
16-20’	308	114	2,082	81	2,473	5,235	802	491	11,585
21-27’	3,936	1,318	23,103	214	9,157	21,114	1,202	4,039	64,085
28-40’	2,446	561	13,666	95	4,063	5,608	321	1,437	28,196
More than 40’	875	217	2,441	98	325	418	27	302	4,705
Total	7,647	2,314	42,583	523	16,364	33,550	2,698	6,558	112,237

Table 33. Number of Boats Using the Great Lakes by Segment and State of Registration

Segment	State of Registration								Total
	IL	IN	MI	MN	NY	OH	Erie County (PA)	WI	
Boats Not in Marinas									
Less than 16’	20,866	15,585	99,343	17,314	28,583	24,179	5,222	55,400	266,493
16-20’	26,503	23,669	88,217	55,391	28,548	22,207	3,077	61,047	308,659
21-27’	5,562	10,305	29,181	11,180	13,390	4,881	826	16,292	91,616
28-40’	999	1,103	3,778	1,070	1,095	788	192	1,575	10,600
More than 40’	124	376	255	306	332	190	17	259	1,860
Boats in Marinas									
Less than 20’	472	218	3,143	232	3,337	6,249	1,149	852	15,652
21-27’	4,373	1,758	23,660	428	7,631	18,475	1,202	3,625	61,153
28-40’	3,424	673	13,666	238	3,533	5,543	321	1,437	28,833
More than 40’	1,000	248	2,441	65	283	374	27	302	4,740
Total	63,323	53,934	263,684	86,225	86,731	82,887	12,033	140,787	789,605
Pct Using GL	16%	10%	32%	10%	18%	20%	69%	23%	19%
Pct in GL Counties	21%	8%	41%	7%	23%	19%	100%	23%	21%

Table 34. Boat Days in Great Lakes States by Segment, Thousands of Boat Days

Segment	State of Registration								Total
	IL	IN	MI	MN	NY	OH	Erie County (PA)	WI	
Boats Not in Marinas									
Less than 16'	2,956	5,520	7,038	6,133	3,375	3,426	160	5,451	34,059
16-20'	4,308	4,809	7,170	11,254	3,867	3,610	134	5,954	41,105
21-27'	1,062	1,377	2,786	1,494	1,790	932	64	1,555	11,061
28-40'	106	110	201	107	146	84	11	157	922
More than 40'	12	23	12	18	40	18	1	22	145
Boats in Marinas									
Less than 20'	66	41	147	65	374	292	2	48	1,035
21-27'	303	152	965	148	1,323	915	13	180	3,999
28-40'	199	46	619	39	720	269	11	69	1,971
More than 40'	55	14	116	10	63	19	1	14	292
Total	9,068	12,092	19,053	19,269	11,696	9,564	397	13,449	94,589

Table 35. Great Lakes Boat Days by Segment and State of Registration, Millions of Boat Days

Segment	State of Registration								Total
	IL	IN	MI	MN	NY	OH	Erie County (PA)	WI	
Boats Not in Marinas									
Less than 16'	313	234	1,490	260	429	363	81	831	4,000
16-20'	530	473	1,764	1,108	571	444	71	1,221	6,183
21-27'	167	309	875	335	402	146	43	489	2,767
28-40'	34	38	128	36	37	27	8	54	362
More than 40'	5	16	11	13	14	8	1	11	78
Boats in Marinas									
Less than 20'	13	6	88	7	93	175	2	24	408
21-27'	153	62	828	15	267	647	12	127	2,110
28-40'	140	28	560	10	145	227	10	59	1,179
More than 40'	44	11	107	3	12	16	1	13	209
Total	1,400	1,176	5,853	1,786	1,970	2,053	230	2,828	17,296
% of boat days on GL[1]	15%	10%	31%	9%	17%	21%	58%	21%	18%

[1] The percent of boat days on the Great Lakes is the ratio of Great Lakes days to the total number of days in Table M6.

Table 36. Characteristics of the Facilities in Great Lakes Zip Codes that Provide Seasonal and Transient Wet Slips and Moorings.

Number of facilities in Great Lakes states	1,192	
Illinois	**Number**	**Percentage**
Number of Marinas	8	100%
Type of Facility		
Marina	7	87%
Yacht Club	0	--
Boatyard/Service Center	1	13%
Campground/Resort	0	--
Condominium	0	--
Number of Wet Slips		
Less than 25	1	13%
25 to 49	4	49%
50 to 99	0	--
100 to 199	0	--
200 to 299	1	13%
300 to 399	0	--
400 to 499	0	--
500 to 999	0	--
More than 1,000	2	25%
Average number of slips	738	
Number & Percentage that Rent Seasonal Wet Slips	6	75%
Number & Percentage that Rent Transient Wet Slips	5	63%
Number & Percentage that Provide Moorings	1	13%
Indiana	**Number**	**Percentage**
Number of Marinas	16	100%
Type of Facility		
Marina	13	81%
Yacht Club	2	13%
Boatyard/Service Center	0	--
Campground/Resort	0	--
Condominium	1	6%
Number of Wet Slips		
Less than 25	1	6%
25 to 49	1	6%
50 to 99	9	57%
100 to 199	2	13%
200 to 299	1	6%
300 to 399	0	--
400 to 499	0	--
500 to 999	1	6%
More than 1,000	1	6%
Average number of slips	180	
Number & Percentage that Rent Seasonal Wet Slips	12	75%
Number & Percentage that Rent Transient Wet Slips	6	38%
Number that Provide Moorings	1	6%

Number of facilities in Great Lakes States	1,192	
Michigan	**Number**	**Percentage**
Number of Marinas	642	100%
Type of Facility		
Marina	436	68%
Yacht Club	58	9%
Boatyard/Service Center	33	5%
Campground/Resort	36	6%
Condominium	79	12%
Number of Wet Slips		
Less than 25	276	44%
25 to 49	103	16%
50 to 99	116	18%
100 to 199	83	13%
200 to 299	32	5%
300 to 399	16	2%
400 to 499	7	1%
500 to 999	8	1%
More than 1,000	1	--
Average number of slips	77	
Number & Percentage that Rent Seasonal Wet Slips	343	53%
Number & Percentage that Rent Transient Wet Slips	241	38%
Number & Percentage that Provide Moorings	52	8%

Minnesota	**Number**	**Percentage**
Number of Marinas	4	100%
Type of Facility		
Marina	4	100%
Yacht Club	0	--
Boatyard/Service Center	0	--
Campground/Resort	0	--
Condominium	0	--
Number of Wet Slips		
Less than 25	1	25%
25 to 49	1	25%
50 to 99	0	--
100 to 199	2	50%
200 to 299	0	--
300 to 399	0	--
400 to 499	0	--
500 to 999	0	--
More than 1,000	0	--
Average number of slips	69	
Number & Percentage that Rent Seasonal Wet Slips	4	100%
Number & Percentage that Rent Transient Wet Slips	4	100%
Number that Provide Moorings	1	25%

Number of facilities in Great Lakes States	1,192	
New York	**Number**	**Percentage**
Number of Marinas	181	100%
Type of Facility		
Marina	119	65%
Yacht Club	26	14%
Boatyard/Service Center	23	13%
Campground/Resort	12	7%
Condominium	1	1%
Number of Wet Slips		
Less than 25	21	12%
25 to 49	48	27%
50 to 99	52	29%
100 to 199	39	22%
200 to 299	9	5%
300 to 399	5	3%
400 to 499	1	1%
500 to 999	0	--
More than 1,000	1	1%
Average number of slips[a]	87	
Number & Percentage that Rent Seasonal Wet Slips	160	88%
Number & Percentage that Rent Transient Wet Slips	110	61%
Number & Percentage that Provide Moorings	14	8%
Ohio	**Number**	**Percentage**
Number of Marinas	275	100%
Type of Facility		
Marina	176	64%
Yacht Club	47	17%
Boatyard/Service Center	5	2%
Campground/Resort	21	8%
Condominium	26	9%
Number of Wet Slips		
Less than 25	69	25%
25 to 49	41	15%
50 to 99	50	18%
100 to 199	62	23%
200 to 299	20	7%
300 to 399	14	5%
400 to 499	7	3%
500 to 999	11	4%
More than 1,000	1	--
Average number of slips	128	
Number & Percentage that Rent Seasonal Wet Slips	153	55%
Number & Percentage that Rent Transient Wet Slips	129	47%
Number that Provide Moorings	4	1%

[a]The average is based on 176 marinas with 15,312 wet slips. Not all marinas reported total of wet slips.

Number of facilities in Great Lakes States	1,192	
Erie County (PA)	**Number**	**Percentage**
Number of Marinas	23	100%
Type of Facility		
Marina	17	74%
Yacht Club	4	17%
Boatyard/Service Center	2	--
Campground/Resort	0	--
Condominium	0	--
Number of Wet Slips		
Less than 25	4	17%
25 to 49	4	17%
50 to 99	5	22%
100 to 199	3	13%
200 to 299	4	17%
300 to 399	1	4%
400 to 499	1	4%
500 to 999	1	4%
More than 1,000	0	--
Average number of slips	140	
Number & Percentage that Rent Seasonal Wet Slips	2	9%
Number & Percentage that Rent Transient Wet Slips	2	9%
Number & Percentage that Provide Moorings	2	9%

Wisconsin	**Number**	**Percentage**
Number of Marinas	63	100%
Type of Facility		
Marina	53	84%
Yacht Club	7	11%
Boatyard/Service Center	0	--
Campground/Resort	3	5%
Condominium	0	--
Number of Wet Slips		
Less than 25	15	24%
25 to 49	13	20%
50 to 99	13	20%
100 to 199	13	20%
200 to 299	6	10%
300 to 399	0	--
400 to 499	1	2%
500 to 999	1	2%
More than 1,000	1	2%
Average number of slips	106	
Number & Percentage that Rent Seasonal Wet Slips	47	75%
Number & Percentage that Rent Transient Wet Slips	46	73%
Number that Provide Moorings	5	8%

5. **Case Study on Economic Impacts of a Great Lakes Marina: Tower Marine**

To test the economic impact models and illustrate a specific application, detailed information was obtained for a Great Lakes commercial marina in southwest Michigan. Tower Marine is located in the twin communities of Saugatuck/Douglas, Michigan, in the natural harbor at the mouth of the Kalamazoo River on Lake Michigan. Tower's ownership enthusiastically volunteered to serve as a case study application of the spending profiles and economic impact model developed for this study.

Tower Marine is a full service marina with 400 deep-water slips offering running water, electricity and telephone service. The marina provides fuel and pump-out service, picnic areas, children's playgrounds, paved parking, a fully stocked ship store, outdoor washrooms and a heated outdoor pool. They also have a year-round service and parts department and provide repair and installation of fiberglass, electrical systems, marine electronics, bottom coatings, running gear, transmission and drive systems and air conditioning systems. Tower Marine also provides cold storage facilities for boats during the off-season.

5.1 Methodology

Detailed information was gathered on the number and size wet slips at provided by the owner of Tower Marine and on the number and size of boats occupying the slips. In addition the owner provided the 2004 rates charged for each occupied slip. Tower Marine also provided financial operating information including various revenues and the number of employees and wages paid those employees. This information was used to verify the model's estimates.

The marina had 395 boats occupying slips during the summer of 2004. The number of boating days by different size boats at Tower Marine was first estimated using information in Tables 32 and 33. The average craft spending by different size boats kept at Great Lakes marinas was adjusted by replacing the general slip rental averages with rates for Tower Marine and omitting the yacht club fee category. Local multipliers were obtained and applied from an input-output model of the Allegan county economy using IMPLAN.

5.2 Summary

The 395 boaters renting slips at Tower Marine spent $2.85 million on annual craft expenses and another $2.85 million on boating trips, accounting for 15,000 days of boating in 2004. The direct economic impacts of trip spending was $1.8 million in sales, $661,00 in wages and salaries and $952,000 in value added to the local economy, supporting 37 jobs. Annual craft expenses directly supported an additional 44 jobs from $2.6 million in direct sales, $834,000 in wages and salaries and $1.5 million in value added.

The sales multiplier for the county is 1.3, yielding total sales, income and job impacts that are roughly 20-30 percent more than the direct effects. Total job impacts including trip and craft spending is 81 direct jobs and 102 total jobs including secondary effects. Roughly 30 of the direct jobs are in the marina and $700,000 of the direct personal income represents the marina's payroll. These estimates are consistent with what the marina has reported.

The following tables demonstrate the application of the impact models to an individual marina. Results are based on the number and size of boats kept at the marina. The general trip spending averages for boats kept at marinas from Table 1 are applied to the 395 boats kept at Tower Marine. Craft spending averages were adjusted for this application to exclude yacht club dues and average slip rates were adjusted to reflect actual rates at Tower Marine. Estimates of trip and craft spending were applied to an input-output model of the Allegan County, Michigan economy.

Table 37. Number of Boats and Boat Days at Tower Marine

Length in feet	Boats	Average Boat Days	Total Boat Days
Less than 20’	10	28	280
21-28’	183	35	6,343
28-40’	144	41	5,867
More than 40’	58	44	2,567
Total	395	38	15,057

Note: Tower Marine, located in Saugatuck, Michigan, had 395 occupied slips during the summer of 2004.

Table 38. Average Annual Craft Expenses for Boats Kept at Tower Marine

Spending Category	Length in feet			
	Less than 20’	21-28’	28-40’	More than 40’
Seasonal slip fees	$1,200	$2,960	$3,580	$4,695
Off season storage	$110	$201	$488	$487
Put in and haul out	$59	$134	$351	$571
Insurance	$267	$343	$742	$1,445
Repairs	$550	$817	$1,474	$2,276
Equipment	$514	$788	$1,303	$1,872
Taxes	$49	$60	$186	$510
Total	$2,750	$5,302	$ 8,123	$11,856

Note: General averages for slip fees from Table 2 are replaced by actual slip rates at Tower Marine in 2004. Yacht club dues are omitted and spending in other categories is assumed to be the same as in Table 2.

Table 39. Total Trip Spending for Boats Kept at Tower Marine ($ Thousands)

Spending Category	Length in feet				
	Less than 20’	21-28’	28-40’	More than 40’	Total
Lodging	$2	$111	$62	$31	$206
Marina services	$0	$39	$122	$82	$243
Restaurant	$5	$186	$217	$127	$535
Groceries	$4	$131	$148	$129	$413
Boat fuel	$6	$294	$258	$200	$759
Auto fuel	$4	$71	$38	$15	$127
Repair/maintenance	$3	$71	$60	$49	$183
Marine supplies	$3	$65	$63	$38	$169
Recreation/entertainment	$0	$34	$48	$19	$102
Shopping	$1	$34	$41	$41	$117
Total ($ 000’s)	$28	$1,036	$1,057	$732	$2,854

Table 40. Total Craft Expenses for Boats Kept at Tower Marine ($ Thousands)

Spending Category	Length in feet				
	Less than 20’	21-28’	28-40’	More than 40’	Total
Slip	$12	$542	$516	$272	$1,342
Off season storage	$1	$37	$70	$28	$136
Put in and haul out	$1	$25	$51	$33	$109
Insurance	$3	$63	$107	$84	$256
Repairs	$5	$149	$212	$132	$499
Equipment	$5	$144	$188	$109	$445
Taxes	$0	$11	$27	$30	$68
Total	$27	$970	$1,170	$688	$2,855

Table 41. Summary of Boating Activity and Spending for Boats Kept at Tower Marine

	Length in feet				
	Less than 20’	21-27’	28-40’	More than 40’	Total
Number of boats	10	183	144	58	395
Average days per boat	28.0	34.7	40.7	44.3	38.1
Total boat days	280	6,343	5,867	2,567	15,057
Average spending per boat day	$101	$163	$180	$285	$190
Trip spending per boat per year	$2,834	$5,663	$7,343	$12,617	$7,225
Craft spending per boat per year	$2,750	$5,302	$8,123	$11,856	$7,228
Total spending per boat per year	$5,583	$10,966	$15,466	$24,473	$14,453
Total craft spending ($000's)	$27	$970	$1,170	$688	$2,855
Total trip spending ($000's)	$28	$1,036	$1,057	$732	$2,854
Total spending ($000's)	$56	$2,007	$2,227	$1,419	$5,709

Table 42. Local Economic Impacts of Trip Spending for Boats Kept at Tower Marine

Sector/Spending Category	Sales $ 000's	Jobs	Personal Income $ 000's	Value Added $ 000's
Direct Effects				
Lodging	$206	4.1	$90	$146
Marina services	$243	4.8	$78	$131
Restaurant	$535	15.0	$212	$239
Recreation/Entertainment	$102	2.0	$33	$55
Repair/Maintenance	$183	1.1	$37	$98
Food processing	$26	-	-	-
Marine supplies	$7	0.0	$2	$2
Petroleum Refining	$61	-	-	-
Retail Trade	$412	9.3	$188	$246
Wholesale Trade	$50	0.6	$19	$32
Other Local Production of Goods	$6	0.1	$2	$3
Total Direct Effects	$1,832	37.0	$661	$952
Secondary Effects	$547	8.8	$169	$2
Total Effects	$2,379	45.8	$829	$954
Multiplier	1.3	1.2	1.3	1.0

Note: Economic Impacts are on the Allegan County, MI economy.

Table 43. Local Economic Impacts of Craft Expenses for Boats Kept at Tower Marine

Sector/Spending category	Sales /$ 000's	Jobs	Personal Income$ 000's	Value Added $ 000's
Direct Effects				
Slip	$1,342	26.4	$431	$722
Off season storage	$136	2.7	$44	$73
Put in and haul out	$109	2.1	$35	$59
Insurance	$256	5.2	$124	$222
Repairs	$499	3.0	$102	$268
Retail Trade	$185	4.2	$84	$111
Wholesale trade	$22	0.2	$8	$14
Local Manufacturer	$19	0.1	$5	$6
Total Direct Effects	$2,568	44.0	$834	$1,474
Secondary Effects	$864	12.0	$277	$484
Total Effects	$3,432	56.0	$1,111	$1,958
Multiplier	1.3	1.3	1.3	1.3

Note: Economic Impacts are on the Allegan County, MI economy.

Table 44. Total Direct and Secondary Economic Effects of Tower Marine

Sector/Spending Category	Sales ($ 000's)	Jobs	Personal Income ($ 000's)	Value Added ($ 000's)
Direct Effects				
Trip spending	$1,832	37	$661	$952
Craft spending	$2,568	44	$834	$1,474
Total Direct Effects	$4,400	81	$1,495	$2,426
Secondary Effects				
Trip spending	$547	9	$169	$2
Craft spending	$864	12	$277	$484
Total Secondary effects	$1,411	21	$446	$486
Total Economic Effects	$5,811	102	$1,941	$2,912

5.3 Dredging for Tower and Other Great Lakes Marinas

Saugatuck Harbor on Lake Michigan, in which Tower Marine is located, is at the mouth of the Kalamazoo River. Natural siltation has prompted the U.S. Army Corps of Engineers to authorize a three-year dredging frequency; the harbor was last dredged in 2004 and is next scheduled to be dredged in 2007. Without this dredging program, according to Tower Marine owner R.J. Peterson, the marina operations in the harbor would be impossible to sustain. Even with the current program, some portions of the Tower marina have draft restrictions limiting the types and sizes of vessels that can be accommodated. Mr. Peterson also stated that even with the harbor authorized at 14 feet, shoaling often reduces available dept to eight feet." Peterson also stated that most neighboring marinas on the west Michigan coast have the same problem, and that if dredging issues are not resolved, the next ten years could see a dramatic loss of marina operations in the area, and with them their economic contributions to the west Michigan economy.

Saugatuck Harbor is dredged on a 3-5 year cycle at approximately $175,000 per dredging operation in 2006 dollars. So, averaging the cost over four years, the harbor costs the Federal government approximately $45,000 per year to maintain. Based on the analysis of Tower Marine's data, recreational boating contributes approximately $2.9 million annually in regional primary and secondary economic impact to the Saugatuck area.

Cornucopia Harbor is located on Wisconsin's Lake Superior shoreline near the Apostle Islands National Lakeshore. The harbor has a scheduled dredging frequency of five years; it was most recently dredged in 2001 and again in 2005. Within the harbor are two marinas, one municipally owned and operated with 40 slips, and the other a private operation, Siscowet Bay Marina, with 50 slips. Almost all the slips are seasonal rentals and historically see close to 100 percent occupancy. The most crucial dredging need is at the harbor entrance, the silting in of which threatens all recreational boating operations in the harbor. According to David Tillman, owner of Siscowet Bay Marina, before the most recent dredging operations channel siltation came close to

shutting down the harbor, putting at risk not only the two marina operations in the harbor (which would have caused a potential loss of $90,000 to $100,000 in dockage fees alone) but also three restaurants and several other local businesses that rely heavily on recreational boating traffic.

Cornucopia Harbor is dredged on a 3 to 5 year cycle at approximately $120,000 per dredging operation in 2006 dollars. So, averaging the cost over 4 years, the harbor costs the Federal government approximately $40,000 per year to maintain. It is indicated that the dockage fees at Siscowet Bay Marina alone account for nearly $100,000 per year of income to the Siscowet Bay Marina, and does not count any income generated from the 40-slip municipally-owned marina. Also lacking in this benefit is the estimated income from boaters using the three restaurants and assorted local businesses that cater products to recreational boaters.

Port Sanilac is located on Lake Huron midway up the Michigan Thumb about 30 miles north of Port Huron. Recreational boaters are served by Port Sanilac Marina Inc., a full service marina offering 120 slips, a 27-ton boat hoist, new and used boat sales brokerage and ships' store. The harbor has a maintenance dredging frequency of three to five years (or more, depending on funding); it was last dredged in 2003 and is scheduled for dredging again as late as 2010.

According to Chester Kolascz, president of Port Sanilac Marina, the primary difficulty in keeping the harbor open is littoral drift of sand which closes the channel. The issue has been significant not only for recreational boats (the larger of which have had access difficulty and sometimes incur hull damage in periods when shoaling combines with low water levels), but coastal property owners also. For the marina alone, lack of access would threaten all phases of operations including boat dockage and storage, which generates $1,400 to $4,000 per slip per year. Kolascz and others in the 700-resident community managed to have the last maintenance dredging done through funds earmarked by their Congressional representative.

Port Sanilac channel is dredged on a 3 to 5 year cycle at approximately $160,000 per dredging operation in 2006 dollars. Averaging the cost over 4 years, the harbor also costs the Federal government approximately $40,000 per year to maintain. The 120-slip Port Sanilac Marina generates a minimum of $1400 per year in dockage and storage fees. Assuming the Marina is generally 90% occupied, that business alone would generate a minimum of $151,000. Additional economic benefit is appreciated in Port Sanilac by the ships' store and boat sales brokerage, and other businesses such as restaurants and convenience stores.

West Harbor, Ohio is located on Lake Erie on the north shore of the Marblehead peninsula. Recreational boats access marina facilities in the harbor via the West Harbor Boat Entrance. Maintenance dredging frequency of the channel and harbor is at least four years; it was last dredged in 2004 but, at last report, is not scheduled for future dredging. One marina serving the harbor is operated by East Harbor State Park; the facility offers 123 slips, dry storage, a restaurant and ships' store. According to Cindy Wagner, manager of the marina, siltation of the access channel has curtailed operations in the past, especially in periods where maintenance dredging lapses combine with low water levels on Lake Erie. At risk during those periods is economic impact including loss of dockage fees ranging from $940 to $1,875 per slip per year at East Harbor State Park. At nearby Anchors Away Marina, curtailment of access due to insufficient channel depth would impact operation of 150 slips with annual fees ranging from

$1,300 to $2,000. Wagner also noted that as dredging lapses continue, navigation channels narrow and boaters veering even slightly out of the channel have experienced grounding and occasional serious hull damage.

Through 2004, the West Harbor Ohio access channel has been dredged twice in nine years (in 1997 and 2004), at average annual cost of approximately $45,000, based on a cost of $200,000 per dredging operation (in 2006 dollars) to maintain the West Harbor Boat Entrance. Calculating a basic low-end dockage fee of $940 per slip and a 75% occupancy rate (92 slips) for the popular East Harbor State Park facility, a gross annual income is generated of $86,480 for just that facility. Adding in the same 75% occupancy rate (113 slips) for the private 150-slip Anchors Away Marina at the lowest cost annual fee ($1,300), an additional gross income of $146,900 is generated by slip rentals alone if the marina is accessible. Also, this combined annual income of $233,380 does not consider the additional revenue generated at the State Park restaurant and gift shop, nor does it consider fuel and other ancillary purchases. The positive economic gain enjoyed at this harbor compares favorably with the costs of maintaining the entrance channel to the harbor.

Irondequoit Bay is a four mile-long, L-shaped bay located on the southern shore of Lake Ontario adjacent to the city of Rochester. It is a convenient and popular site for recreational boating; within Irondequoit Bay there are seven marinas offering a total of 908 slips, almost all of which are seasonal rentals with close to 100 percent occupancy. Currently, at least two marinas are seeking permits to expand. The largest in Irondequoit Bay (in terms of slip numbers) is Mayer's Marina, which is also closest to the harbor entrance. Mayer's maintains close to 300 slips, most of which accommodate smaller boat sizes. These slips generate approximately $250,000 per year in fees for Mayer's.

According to William Mayer, who has owned the marina since the 1960s, lapses in dredging pose a serious economic threat to not only his and other marinas on Irondequoit Bay, but also to the recreation-oriented economies of three municipalities fronting the bay, the towns of Webster, Penfield and Irondequoit. Mayer estimated that curtailment of operations due to insufficient access channel depth would likely cost him in excess of $180,000 a month in fuel sales alone, where the marina store and that aggregate losses among all marinas and related operations would likely be in the range of multiple millions of dollars annually.

The 187-slip Newport Marina caters to larger (30+ feet), deeper draft recreational craft. Russ DaCappa said that the marina could count on slip rental revenue exceeding $200,000 per year, with nearly full capacity. DaCappa also said that boat fuel sales are also close to $200,000 per year; a ships store, pump-out and haul-out services add to Newport's annual revenue stream. Some owners of the largest vessels have already informed Newport that the channel is becoming too shallow, and those vessels will not be utilizing the harbor next season. Also, Sutter Marina, South Pointe Marina and the Rochester Canoe Club (Sailboats) all utilize the harbor entrance channel to access Lake Ontario. Dockominiums totaling about 300 slips and pull-up restaurants also ring the bay, bringing the total number of shallow draft slips in Irondequoit Bay to well over 1000.

Mr. Robert Blono of the Bayside Restaurant said that much of his spring through fall customer base is “pull-up” boaters who tie up to his slips and dine at his restaurant. Many of the clientele he sees are charter fishermen from the open lake who use the access channel to get to the restaurant. He is also a recreational boater who attests that accessing the Bay from the open lake is getting more difficult on a weekly basis. Without the access channel being maintained, he expects his business and others who cater to recreational boaters to see moderate to severe declines in business and revenue. The 24-slip Zack Marine Services concurred, stating that “silting in of the access channel to the lake would be a serious detriment to our business”.

Mario's Italian Steakhouse and Catering on the bay indicates that they are catered by about 40-50 boats per week from spring through the fall that are transient, along with other normal restaurant business. The business generates $4 million a year in revenue and over $150,000 in tax revenue for Monroe County. Without normal maintenance dredging, the business may lose up to a quarter of its revenue, or about $1 million a year.

The Irondequoit Bay channel that provides the access to the bay has a dredging frequency of six years, though it was last dredged in 2000, with no currently scheduled dredging work. The average annual cost to maintain this channel (based on this decade) is approximately $50,000 in 2006 dollars.

5.4 Summary

Based in these simple examples of how recreational boating generated income impacts shallow-draft recreational harbors on each of the Great Lakes as a representation, maintenance dredging (as a stand-alone function) of recreational harbors lends to significant primary and secondary positive economic impacts on the Great Lakes. These examples have not considered the additional physical costs of disposing the dredged materials in upland sites, and the associated locally-borne costs of securing these disposal sites – such as acquiring land and preparing the site for placement of the material. However, the sites needed for material disposal are generally not very large and do not result in significant expenses. If access to the shallow-draft harbors or access channels ceases, the economies of many harbor businesses on the Great Lakes that rely heavily on income generated through recreational boating activities will be affected.

6. Watercraft Manufacturing and Sales

A thorough analysis of economic benefits derived from Great Lakes recreational boating would not be complete without data on the region's resident watercraft manufacturing industry, its suppliers of engines and accessories, and the related sales and distribution activity. Manufacturers of recreational boating equipment can be found throughout the eight Great Lakes states, in large communities and small ones, involving large multinational corporations and small family owned businesses.

6.1 Methodology

A database of manufacturers that have been issued Manufacturer Identification Codes (MIC) was obtained in May 2004 from the Coast Guard. Prior to 1972 there were no federal or state regulations governing hull numbers. Recreational boats sold or imported into the United States are required to have a twelve character Hull Identification Number (HIN). The first three letters of that number are the Manufacturer's Identification Code (MIC). Manufacturers are required to apply in writing to the United States Coast Guard for assignment of a MIC.

The Coast Guard maintains a database of all recreational boat manufacturers in the United States, and U.S. importers of recreational boats. This database contains active, out of business and Canadian manufacturers. If a manufacturer goes out of business, the Coast Guard then retires the MIC for 10 years before re-issuing it to a new manufacturer.

A multi-step process was employed to identify manufacturers currently producing watercraft. This process involved: (1) searching the Internet for web sites of all manufacturers headquartered in Great Lakes states that were in the U.S. Coast Guard database of all recreational boat manufacturers, (2) searching electronic and published yellow pages for current listings of these manufacturers, (3) identifying powerboat manufacturers by any of these companies that were registered anywhere in the country during 2003, (4) making telephone calls to all manufacturers that were identified in steps 1-3 to verify that they are in business, and finally, (5) sending a mail-delivered assessment to the 250 Great Lakes states manufacturers determined to be in business in 2004.

Among other information the study collected the numbers of boats manufactured in 2003 and expected to be produced in 2004. Forty percent (101) of the 250 watercraft manufacturers completed this assessment.

The National Marine Manufacturers Association also provided the most current available information on purchases of powerboats, trailers and accessories. In addition, information on 2003 boat sales was obtained with assistance of the National Marine Manufacturers Association (NMMA) for 91 of the 250 watercraft manufacturers headquartered in the Great Lakes that produce powerboats. An analysis of 2003 new boat registrations nationwide provided information on the different states where boats manufactured by these powerboat manufacturers were registered during 2003. This provides a very good indication of where boats produced by manufacturers headquartered in the Great Lakes are sold.

6.2 Summary

It is estimated that 182,700 watercraft were manufactured in 2003 by the 250 manufacturers with headquarters in Great Lakes states. An analysis of 2003 new boat registrations shows that 10 percent of the boats sold by 91 powerboat manufacturers headquartered in the Great Lakes states were registered/sold in the states where the manufacturers are headquartered; 29 percent were registered/sold in other Great Lakes states; and 61 percent were sold outside the Great Lakes states.

So, while there is a significant economic benefit from the export of watercraft manufactured in the states bordering the Great Lakes, these manufacturers depend significantly on Great Lakes state boaters and boating opportunities.

The study of manufacturers revealed that the greatest percentage (44 percent) of these manufacturers is small businesses having five or fewer employees. Conversely, 13 percent employ more than 100 employees. Based on a weighted analysis of the assessment results it is conservatively estimated that watercraft manufacturers in the Great Lakes states employ 18,500 persons.

Table 45. Types of Boats Produced by Great Lakes Marine (N=250)[a]

Type of Boat Manufactured	Number of Great Lakes States Manufacturers [a]	Percentage of Great Lakes States Manufacturers [a]
ATV/Hovercraft	3	1.2%
Canoes/Kayaks	47	18.8%
Houseboats	2	0.8%
Inboard/Outboards	47	18.8%
Inboards	18	7.2%
Outboards	58	23.2%
Personal Watercraft	3	1.2%
Pontoon Boats	39	15.6%
Sailboats	23	9.2%
Thrill craft (e.g, jetboats, raceboats)	6	2.4%
Miscellaneous (e.g. electric launches, inflatable boats, water toys.)	31	12.4%

a. Some manufacturers manufacture more than one type of boat so the % do not add up to 100%

Information provided by the National Marine Manufacturers Association shows that residents of Great Lakes states represent almost a quarter (23.6 percent) of the 2003 nationwide purchases of new powerboats, outboard motors, trailers and accessories.

Residents of Great Lakes states bought about 27 percent of all outboard motor boats and 31 percent of jet drive boats sold in 2003. More than a quarter (27.3 percent) of trailers purchased nationwide in 2003 were bought by residents of Great Lakes states. The boating opportunities on

the Great Lakes and in the Great Lakes states on inland lakes and rivers generate significant sales of boats and boating accessories.

This process to identify Great Lakes watercraft manufacturers produced an up-to-date list of 250 recreational watercraft manufacturers currently in business in the Great Lakes states. The majority of the manufacturers headquartered in Great Lakes states produce powerboats including outboards (58 manufacturers), inboards/outboards (47 manufacturers), pontoons (39 manufacturers) and inboards (18 manufacturers). There are also 47 canoe/kayak makers and 23 sailboat manufacturers. Some of these are very small, producing only 2 craft annually (e.g., specialty boats, canoes/kayaks). Forty nine percent manufactured 20 or less watercraft in 2003; conversely nine percent produces more than 3,000 craft.

Table 46. Number and Average Price of Power Boats Sold in the Great Lakes States, 2003

	Units Sold[a]								Total Units	
	Outboard Boats		Sterndrive Boats		Inboard Boats		Jet Drive Boats			
Average Retail Price	$13,244		$ 32,097		$189,736		$ 20,584			
STATES	#	%	#	%	#	%	#	%	#	%
Illinois	5,529	2.7%	1,973	2.9%	285	1.4%	136	2.4%	7,923	2.6%
Indiana	4,292	2.1%	1,176	1.7%	283	1.4%	47	0.8%	5,798	1.9%
Michigan	7,830	3.8%	3,141	4.5%	941	4.6%	546	9.7%	12,458	4.1%
Minnesota	13,095	6.3%	2,767	4.0%	350	1.7%	201	3.6%	16,413	5.4%
New York	5,920	2.9%	3,879	5.6%	640	3.1%	360	6.4%	10,799	3.6%
Ohio	4,523	2.2%	1,667	2.4%	337	1.7%	178	3.2%	6,705	2.2%
Erie County (PA)	4,300	2.1%	1,172	1.7%	214	1.0%	83	1.5%	5,769	1.9%
Wisconsin	11,116	5.4%	2,079	3.0%	466	2.3%	182	3.3%	13,843	4.6%
All Great Lake States	56,605	27.3%	17,854	25.8%	3,516	17.2%	1,733	30.9%	79,708	26.4%
All Other States	150,495	72.7%	51,346	74.2%	16,884	82.8%	3,867	69.1%	222,592	73.6%
STATES	$ Sales								Total $ Sales	
	Outboard Boats		Sterndrive Boats		Inboard Boats		Jet Drive Boats			
	$	%	$	%	$	%	$	%	$	%
Illinois	$73,225,904	0.0%	$63,327,508	2.9%	$54,074,732	1.4%	$2,799,370	2.4%	$193,427,513	2.2%
Indiana	$56,843,115	2.1%	$37,746,147	1.7%	$53,695,260	1.4%	$967,429	0.8%	$149,251,951	1.7%
Michigan	$103,700,277	3.8%	$100,816,879	4.5%	$178,541,482	4.6%	$11,238,646	9.8%	$394,297,283	4.4%
Minnesota	$173,429,773	6.3%	$88,812,577	4.0%	$66,407,565	1.7%	$4,137,304	3.6%	$332,787,218	3.7%
New York	$78,404,296	2.9%	$124,504,512	5.6%	$121,430,976	3.1%	$7,410,096	6.4%	$331,749,880	3.7%
Ohio	$59,902,471	2.2%	$53,505,806	2.4%	$63,940,998	1.7%	$3,663,881	3.2%	$181,013,156	2.0%
Erie County (PA)	$56,949,066	2.1%	$37,617,759	1.7%	$40,603,483	1.0%	$1,708,439	1.5%	$136,878,747	1.5%
Wisconsin	$147,219,958	5.4%	$66,729,796	3.0%	$88,416,929	2.3%	$3,746,215	3.2%	$306,112,899	3.4%
All Great Lake States	$749,674,860	24.7%	$573,060,984	25.8%	$667,111,425	17.2%	$35,671,380	30.9%	$2,025,518,647	22.6%
All Other States	1,993,151,100	75.3%	1,648,055,856	74.2%	3,203,500,935	82.8%	79,596,780	69.1%	6,924,304,673	77.4%

Source: National Marine Manufacturers Association's 2003 Recreational Boating Statistical Abstract. Units Sold does not include PWCs sold in these states. The number of PWCs sold are as follows : IL-2,437, IN-1,392, MI-4,239, MN-2,806, OH-2,393, PA-1,381, NY-3,368.

Table 47. Number and Total Sales of New Power Boats, Outboard Motors, Trailer and Accessory Purchases in the Great Lakes States, 2003

STATES	New Power Boats		Outboard Motor		Boat Trailers		Marine Accessories		Total Expenditure	
	$	%	$	%	$	%	$	%	$	%
Illinois	$215,089	2.2%	$66,184	2.6%	$5,393	2.7%	$49,005	2.3%	$335,671	2.3%
Indiana	$161,626	1.7%	$42,880	1.7%	$4,187	2.1%	$35,675	1.7%	$244,368	1.7%
Michigan	$431,981	4.5%	$110,970	4.3%	$7,638	3.8%	$ 94,121	4.4%	$644,709	4.4%
Minnesota	$357,732	3.7%	$142,964	5.6%	$12,773	6.3%	$87,775	4.1%	$601,244	4.1%
New York	$361,689	3.7%	$95,698	3.7%	$5,775	2.9%	$79,176	3.7%	$542,337	3.7%
Ohio	$202,282	2.1%	$51,760	2.0%	$ 4,412	2.2%	$44,182	2.1%	$302,636	2.1%
Erie County (PA)	$149,159	1.5%	$51,925	2.0%	$4,194	2.1%	$ 35,091	1.7%	$240,370	1.7%
Wisconsin	$322,705	3.3%	$116,130	4.5%	$10,843	5.4%	$76,871	3.6%	$526,549	3.6%
All Great Lake States	$2,202,264	22.8%	$678,511	26.6%	$ 55,214	27.3%	$501,896	23.6%	$3,437,885	23.6%
All Other States	$7,464,061	77.2%	$1,876,023	73.4%	$146,798	72.7%	$1,621,744	76.4%	$11,108,626	76.4%

Source: National Marine Manufacturers Association's 2003 Recreational Boating Statistical Abstract.

Table 48. Number of Watercraft Sold in the Great Lakes States by Manufactures Headquartered in the Great Lakes States, 2003 (N=91). [a]

State	Units Sold[b]		Units Sold in the Manufacturer's State[c]		Units sold in other GL States (not mfg. state)		Units sold in non-Great Lakes States	
	Number Sold	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Illinois	3,630	3%	281	2%	928	3%	2,421	3%
Indiana	24,027	20%	1,005	8%	9,596	28%	13,426	19%
Michigan	17,483	15%	1,176	9%	3,790	11%	12,517	17%
Minnesota	34,249	29%	8,776	71%	9,636	28%	15,837	22%
New York	424	0%	27	0%	150	0%	247	0%
Ohio	1,104	1%	80	1%	345	1%	679	1%
Erie County (PA)	1	0%	0	0%	0	0%	1	0%
Wisconsin	37,546	32%	1,139	9%	9,634	29%	26,773	38%
Total	118,464[d]	100%	12,484	100%	34,079	100%	71,901	100%

a. 91 powerboat manufacturers were identified through studies conducted of all boat manufacturers in the Great Lakes states. A total of 250 watercraft manufacturers were verified to be producing craft in 2003. Units Sold includes PWCs.
b. Source: NMMA's 2003 Recreational Boating Statistical Abstract.
c. Source: NMMA's 2003 Recreational Boating Statistical Abstract.
d. On the basis of a study of the 250 currently producing Great Lakes watercraft manufacturers that were identified (101 assessments were returned) and the information on the 91 powerboat manufacturers, it is estimated that 182,700 watercraft are sold by manufacturers headquartered in Great Lakes States. It is estimated that 71,253 are sold to residents of the Great Lakes states.

7. Economic Impact of Great Lakes Charter Fishing Boats

Sportfishing, with its strong ties to boating, is a major activity in the Great Lakes states. Studies indicate that about half of all fishing in Great Lakes states is accomplished with the use of a boat. According to the most recent five-year participation conducted by the U.S. Fish and Wildlife Service, more than 11 million anglers - 16 years old and older - fished both inland and Great Lakes waters in 1996. This accounts for more than 36 percent of the national figure.

These anglers represent about 160,000 days of fishing, with angling directly on the Great Lakes comprising 15 percent of the total. Regarding fishing trip and equipment expenditures related to freshwater fishing, the Great Lakes states huge $10 billion figure represents about 41 percent of the nation's freshwater total. The binational Great Lakes Fishery Commission estimates that all Great Lakes state sportfishing accounts for up to $4 billion in economic impact.

For non-boat owning anglers in the Great Lakes, and for visitors to the Great Lakes states, charter-fishing operations have provided a welcome service. For the local economies of Great Lakes coastal communities – including many served only by shallow draft harbors – charter-fishing boats generate significant economic impact. This impact has been studied extensively in recent years by the Great Lakes Sea Grant Network led by Ohio Sea Grant which coordinated a study of charter boat captains, the findings of which are reported below.

The Recreational Marine Research Center gathered the data from Sea Grant and other similar charter fishing studies, and applied tourism spending profile models to paint an even broader picture of the basin-wide economic impact of the Great Lakes charter fishing industry.

7.1 Sea Grant Methodology

Sea Grant conducted a comprehensive study of the Great Lakes charter fishing industry in 2002. The study provides information on the status, characteristics and economics of the charter fishing business. Out of an estimated total of 1,932 Great Lakes charter captains, 1,767 captains were studied, and 868 returned the assessment with usable data.

Table 49. Study Participants by Jurisdiction and Homeport

Jurisdiction		Homeport	
Ohio	41%	Lake Erie/St. Clair	42%
Michigan	24%	Lake Michigan	33%
New York	16%	Lake Ontario/Niagara River/St. Lawrence River	15%
Wisconsin	13%	Lake Huron and Lake Superior	5%
Illinois-Indiana	3%		
Minnesota	2%		
Pennsylvania	1%		

7.2 Summary: Sea Grant study

Following general statistics about the charter fishing industry were generated from the study.

- 90% of the captains operate their own charter firm.
- 89% of charter fishing businesses operate one charter boat.
- Charter boats are typically 28.8 feet long and nearly 16 years old.
- Captains average 28.3 full-day and 25.1 half-day paid charter trips per year.
- Average cost of the half-day lake trout and salmon charter is $328 per boat (ranging from $25 to $560 across the sector).
- The total population of active captains yields an estimated 93,209 charter trips (53% were full day and 47% were half-day).
- Estimated annual revenues are $19,782:
  Net positive earnings of $4,298 for firms making boat loan payments.
  Net positive earnings of $8,339 for firms not making boat loan payments.

Figure 7.2.1 Number of Active Charter Fishing Captains by State in 2002

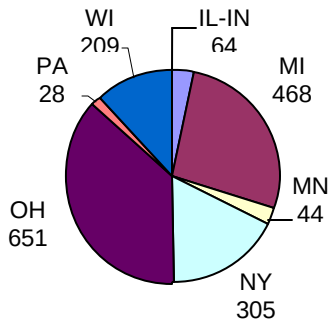
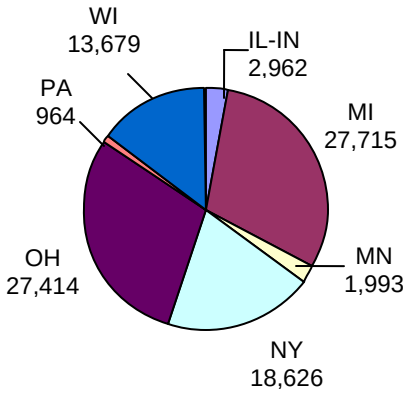


Figure 7.2.2. Number of Charter Fishing Trips by State in 2002



To further define charter fishing's impact on local economies in the Great Lakes, shown below are average year expenditures for a charter boat captain. Business owning charter captains, totaling 1,746 in the Great Lakes, spend an average of $11,443 annually on operating expenses for a total of $19.98 million. By far the greatest proportion is spent in or near the coastal

communities where their boats are kept. The direct economic impacts of these charter boat operating expenses is $15.4 million in sales, $8.0 million in wages and salaries and $12.6 million in value added to the local economy which supports 657 jobs. The largest, annual operating expenses for boat-owning captains were fuel and oil, dockage, hired labor and equipment and repair. Table 50 presents the average annual operating costs by expenditure item, i.e. fuel, dockage, labor, equipment repair, etc.

Table 50. Average Annual Operating Costs for Great Lakes Boat-Owning Captains

Item	Expense	# of Respondents
Fuel/Oil	$2,282	635
Dockage	$1,417	637
Labor (hired)	$1,288	624
Equipment Repair	$1,083	636
Advertising	$897	627
Miscellaneous	$823	632
Insurance	$785	637
Boating Maintenance & Repair	$772	635
Office & Communications	$628	626
Boat Storage Fees	$620	636
Boat Repair Not Covered by Insurance	$355	636
License Fees	$162	632
Drug Testing/Professional Dues	$125	638
Boat Launch Fees	$53	635
Total Operating Costs	$11,443	614

Operational expenditures totals for the Great Lakes are presented in Table 51 These totals are calculated by multiplying average annual expenses for boat-owning captain with the estimated number of Great Lakes charter captains for 2002 (1,746 firms). This table indicates that aside from the net income of the charter fishing business alone, the charter fishing industry in 2002 is estimated to put $19.7 million dollars into the Great Lakes states economy.

Table 51. Estimated Annual Operational Expenditure Totals for the U.S. Great Lakes.

Item	Expenditure Totals (in millions)
Fuel/Oil	$4.0
Dockage	$2.5
Labor (hired)	$2.2
Equipment Repair	$1.9
Advertising	$1.6
Miscellaneous	$1.4
Insurance	$1.4
Boating Maintenance & Repair	$1.3
Office & Communications	$1.1
Boat Storage Fees	$1.1
Boat Repair Not Covered by Insurance	$0.6
License Fees	$0.3
Drug Testing/Professional Dues	$0.2
Boat Launch Fees	$0.1
Total Operating Costs	$19.7

Charter fishing firms brought in estimated total sales of $34.5 million. Table 52 presents total sales average income, and average cost and net profits by state.

Table 52. Average Income, Average Economic Cost, Estimated Net Profit or Loss for Great Lakes Charter Businesses by State

Region/Water Body	Est. # of Businesses	Ave. Income/ Business	Ave. Economic Cost/Business*	Net Return (Profit or Loss)	Est. Total Sales (in millions)
All GL States	1,746	$19.782	$20,573	$(-791)	$34.5[1]
689 respondents			or $15,704	or $4,078	
IL-IN	64	$15,484	$21,277	$(-5,793)	$1.0
20 respondents			or $18,430	or $(-2,946)	
MI	468	$22,200	$22,317	$(-117)	$10.4
183 respondents			or $17,386	or $4,814	
MN	44	$13,983	$16,973	$(-2,990)	$0.6
24 respondents			or $14,333	or $(-350)	
NY	305	$22,907	$18,594	$4,313	$7.0
124 respondents			or $14,741	or $8,166	
OH	651	$15,956	$20,381	$(-4,426)	$10.4
213 respondents			or $14,585	or 1,370	
PA	28	$13,312	$10,427	$2,885	$0.4
12 respondents			or $9,427	or $3,885	
WI	209	$22,340	$21,599	$741	$4.7
85 respondents			or $16,482	$5,912	

*The average economic cost calculated with and without depreciation costs.
[1] The combined estimates for the individual lakes do not equal the estimates for all the Great Lakes states because of missing data and differing estimation methodologies.

7.3 Economic Impacts of Charter Fishing by State

Illinois-Indiana

- 64 active captains; 64 licensed captains.
- 100% of the captains operate their own charter firm.
- 91% of charter fishing businesses operate one charter boat.
- Charter boats are typically 31.7 feet long and nearly 21.5 years old.
- Captains average 6.5 full-day and 40 half-day paid charter trips per year.
- Averaged cost of the half-day lake trout and salmon charter trip – the most popular trip - is $380 per boat. (ranging $240 to $520)
- The active captains in Illinois-Indiana yield an estimated 2,962 charter trips. (14% were full-day and 86% were half-day)
- Estimated annual revenues are $15,484: with a net cash flow of - $2,434 for firms making boat loan payments and net cash flow of $1,966 for firms not making boat loan payments.
- Charter fishing firms brought in estimated total sales of $1 million.

Table 53. Average Annual Operating Costs for Illinois-Indiana's Boat-Owning Captains

Item	Expense	IL-IN Total[1]
Fuel/Oil	$2,014	$128,896
Dockage	$2,272	$145,408
Equipment Repair	$1,159	$74,176
Boating Maintenance & Repair	$1,138	$72,832
Boat Storage Fees	$1,047	$67,008
Labor	$979	$62,656
Insurance	$897	$57,408
Miscellaneous	$553	$35,392
Office & Communications	$374	$23,936
Boat Repair Not Covered by Insurance	$298	$19,072
License Fees	$222	$14,208
Drug Testing/Professional Dues	$105	$6,720
Boat Launch Fees	$18	$1,152
Total Operating Costs	$13,518	$708,864

[1]Expenses multiplied by the number of active captains (64) in 2002.

Michigan

- 468 active captains; 468 licensed captains.
- 95% of the captains operate their own charter firm.
- 89% of charter fishing businesses operate one charter boat.
- Charter boats are typically 29.5 feet long and nearly 17 years old.
- Captains average 18.3 full-day and 40.9 half-day paid charter trips per year.
- Average cost of the half-day lake trout and salmon charter is $338 per boat. (ranging $70 to $560)
- Captains in Michigan yield an estimated 27,715 charter trips. (31% were full-day and 69% were half-day)
- Estimated annual revenues are $22,200, with a net cash flow of $5,090 for firms making boat loan payments and net cash flow of $9,705 for firms not making boat loan payments.
- Charter fishing firms brought in estimated total sales of $10.1 million.

Table 54. Average Annual Operating Costs for Michigan's Boat-Owning Captains

Item	Expense	MI Totals[1]
Fuel/Oil	$2,361	$1,104,948
Labor	$1,965	$919,620
Dockage	$1,668	$780,624
Equipment Repair	$1,159	$542,412
Boat Maintenance and Repair	$885	$414,180
Miscellaneous	$829	$387,972
Advertising	$763	$357,084
Boat Storage Fees	$760	$355,680
Insurance	$759	$355,212
Office and Communications	$588	$275,184
Boat Repair Not Covered by Insurance	$335	$156,780
Drug Testing/Professional Dues	$143	$66,924
License Fees	$185	$86,580
Boat Launch Fees	$94	$43,992
Total Operating Costs	$12,495	$5,847,192

[1]Expenses multiplied by the number of active captains (468) in 2002.

Minnesota

- 44 active captains; 44 licensed captains.
- 100% of the captains operate their own charter firm.
- 84% of charter fishing businesses operate one charter boat.
- Charter boats are typically 27.8 feet long and nearly 22 years old.
- Captains average 9 full-day and 36 half-day paid charter trips per year.
- Average cost of the half-day lake trout and salmon charter is $282 per boat. (ranging $25 to $385)
- Captains in Minnesota yield an estimated 1,993 charter trips. (20% were full-day and 80% were half-day)
- Estimated annual revenues are $13,983 with a net cash flow of $56 for firms making boat loan payments and a net cash flow of $2,819 for firms not making boat loan payments.
- Charter fishing firms brought in estimated total sales of $615,260.

Table 55. Average Annual Operating Costs for Minnesota's Boat-Owning Captains

Item	Expense	MN Totals[1]
Equipment Repair	$1,992	$87,648
Fuel/Oil	$1,473	$64,812
Labor	$1,399	$61,556
Advertising	$1,093	$48,092
Miscellaneous	$960	$42,240
Boat Maintenance and Repair	$907	$39,908
Dockage	$904	$39,776
Insurance	$785	$34,540
Office and Communications	$700	$30,800
Boating Storage Fees	$391	$17,204
License Fees	$297	$13,068
Boat Repair Not Covered by Insurance	$134	$5,896
Drug Testing/Professional Dues	$118	$5,192
Boat Launch Fees	$11	$484
Total Operating Costs	$11,164	$491,216

[1]Expenses multiplied by the number of active captains (44) in 2002.

New York

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- 305 active captains; 305 licensed captains.
- 99% of the captains operate their own charter firm.
- 81% of charter fishing businesses operate one charter boat.
- Charter boats are typically 26.7 feet long and nearly 15 years old.
- Captains average 50 full-day and 11.1 half-day paid charter trips per year.
- Average cost of the full-day lake trout and salmon charter, the most popular trip, is $407 per boat. (ranging $200 to $507)
- Captains in New York yield an estimated 18,626 charter trips. (82% were full-day and 18% were half-day)
- Estimated annual revenues are $22,907 with a net cash flow of $8,038 for firms making boat loan payments and a net cash flow of $11,814 for firms not making boat loan payments.
- Charter fishing firms brought in estimated total sales of $7 million.

Table 56. Average Annual Operating Costs for New York's Boat-Owning Captains

Item	Expense	NY Totals[1]
Fuel/Oil	$1,895	$577,975
Advertising	$1,200	$366,000
Labor	$1,168	$356,240
Equipment Repair	$1,115	$340,075
Dockage	$1,096	$334,280
Miscellaneous	$901	$274,805
Insurance	$831	$253,455
Boat Maintenance and Repair	$717	$218,685
Office and Communications	$531	$161,955
Boating Storage Fees	$429	$130,845
Boat Repair Not Covered by Insurance	$276	$84,180
Drug Testing/Professional Dues	$92	$28,060
License Fees	$91	$27,755
Boat Launch Fees	$33	$10,065
Total Operating Costs	$11,093	$3,164,375

[1]Expenses multiplied by the number of active captains (305) in 2002.

Ohio

- 651 active captains; 794 licensed captains.
- 82% of the captains operate their own charter firm.
- 91% of charter fishing businesses operate one charter boat.
- Charter boats are typically 28.6 feet long and nearly 13 years old.
- Captains average 36 full-day and 6 half-day paid charter trips per year.
- Average cost of the full-day walleye charter, the most popular trip, is $404 per boat. (ranging $66 to $675)
- Captains in Ohio yield an estimated 27,414 charter trips. (85% were full-day and 15% were half-day)
- Estimated annual revenues are $15,956 with a net cash flow of $815 for firms making boat loan payments and a net cash flow of $5,327 for firms not making boat loan payments.
- Charter fishing firms brought in estimated total sales of $10.97 million.

Table 57. Average Annual Operating Costs for Ohio's Boat-owning Captains

Item	Expense	OH Totals[1]
Fuel/Oil	$2,453	$1,596,903
Dockage	$1,396	$908,796
Equipment Repair	$975	$634,725
Labor	$907	$590,457
Advertising	$798	$519,498
Insurance	$787	$512,337
Miscellaneous	$785	$511,035
Boat Maintenance and Repair	$714	$464,814
Office and Communications	$692	$450,492
Boating Storage Fees	$513	$333,963
Boat Repair Not Covered by Insurance	$298	$193,998
License Fees	$134	$87,234
Drug Testing/Professional Dues	$129	$83,979
Boat Launch Fees	$42	$27,342
Total Operating Costs	$10,629	$6,915,573

[1]Expenses multiplied by the number of active captains (651) in 2002.

Pennsylvania

- 28 active captains; 28 licensed captains.
- 100% of the captains operate their own charter firm.
- 92% of charter fishing businesses operate one charter boat.
- Charter boats are typically 25.4 feet long and nearly 14.2 years old.
- Captains average 24.9 full-day and 9.5 half-day paid charter trips per year.
- Average cost of the full-day walleye charter, the most popular trip, is $429 per boat. (ranging $300 to $650)
- Captains in Pennsylvania yield an estimated 964 charter trips. (72% were full-day and 28% were half-day)
- Estimated annual revenues are $13,312 with a net cash flow of $2,042 for firms making boat loan payments and a net cash flow of $6,620 for firms not making boat loan payments.
- Charter fishing firms brought in estimated total sales of $372,750.

Table 58. Average Annual Operating Costs for Pennsylvania's Boat-Owning Captains

Item	Expense	PA Total[1]
Fuel/Oil	$1,443	$40,404
Dockage	$803	$22,484
Equipment Repair	$672	$18,816
Miscellaneous	$659	$18,452
Advertising	$651	$18,228
Office and Communications	$617	$17,276
Insurance	$614	$17,192
Boating Storage Fees	$357	$9,996
Labor	$319	$8,932
Boat Maintenance and Repair	$290	$8,120
License Fees	$83	$2,324
Drug Testing/Professional Dues	$79	$2,212
Boat Repair Not Covered by Insurance	$33	$924
Boat Launch Fees	$0	$0
Total Operating Costs	$6,620	$185,360

[1] Expenses multiplied by the number of active captains (28) in 2002.

Wisconsin

- 209 active captains; 258 licensed captains
- 81% of the captains operate their own charter firm
- 79% of charter fishing businesses operate one charter boat
- Charter boats are typically 30.6 feet long and nearly 19.4 years old.
- Captains average 9.7 full-day and 55.7 half-day paid charter trips per year
- The average cost of the half-day lake trout and salmon charter, the most popular trip, is $332 per boat (ranging from $75 to $550)
- Captains in Wisconsin yield an estimated 13,679 charter trips (15% were full-day and 85% were half-day)
- Estimated annual revenues are $22,340 with a net cash flow of $8,240 for firms making boat loan payments and a net cash flow of $10,678 for firms not making boat loan payments
- Charter fishing firms brought in estimated total sales of $4.8 million

Table 59. Average Annual Operating Costs for Wisconsin's Boat-Owning Captains

Item	Expense	WI Total[1]
Fuel/Oil	$2,562	$535,458
Dockage	$1,343	$280,687
Labor	$1,046	$218,614
Advertising	$1,009	$210,881
Equipment Repair	$956	$199,804
Boating Storage Fees	$851	$177,859
Miscellaneous	$850	$177,650
Insurance	$767	$160,303
Office and Communication	$726	$151,734
Boat Maintenance and Repair	$676	$141,284
Boat Repair Not Covered by Insurance	$410	$85,690
License Fees	$251	$52,459
Drug Testing/Professional Dues	$135	$28,215
Boat Launch Fees	$39	$8,112
Total Operating Costs	$11,662	$2,428,750

[1]Expenses multiplied by the number of active captains (209) in 2002.

7.4 Supplemental Charter Fishing Impact: RMRC Methodology

A similar approach to the one employed for recreational boating was utilized to estimate the economic impacts of charter fishing in the Great Lakes states. Various forms of data were used to develop the estimates including the results of a comprehensive study of the charter fishing industry of the Great Lakes fall of 2002 and winter of 2003 conducted by Sea Grant.

These studies generated provided the most current information on: (1) the number of charter fishing boats operating in Great Lakes states, (2) the average number of charter trips by boats operating in different states, (3) the total number of charter trips in each state, (4) the estimated revenue per boat and, (5) details on average annual operating expenses.

Estimates of the number of persons comprising charter fishing parties, the proportion of day and overnight charter fishing related trips, and the number of overnight trips using different types of lodging (e.g., motels, campgrounds) were derived from previous studies of charter fishing conducted in Michigan, Ohio and New York.

Spending profiles for day trips and overnight trips by charter fishing customers were developed based on tourism spending profiles developed for the Michigan Tourism Economic Impact Model (MITEIM). The MITEIM model employs visitor-spending profiles for a set of travel segments to estimate visitor spending and a set of sector-specific multipliers.

A database of spending profiles for different tourism market segments has been developed for use with the MITEIM model. The tourist spending averages yield total spending consistent with the state's lodging room use tax collections and selected other sources. Recent work to estimate state and local area tourism satellite accounts has also produced estimates that are consistent with the MITEIM model.

The MITEIM average spending profiles for day trips and overnight trips were adjusted to reflect the makeup of charter fishing parties (i.e., more parties comprised of friends rather than all family members) and the distribution of trip spending (i.e., more spending on entertainment, food and more rooms rented per party).

7.5 RMRC Summary

It is estimated that charter fishing in the Great lakes states produces in excess of 81,000 party days/nights of travel annually to communities near where the charter boats are kept. About two thirds are day trips. Local average spending per party on day trips is estimated to be $197 including restaurants, takeout food and beverages, entertainment and shopping. Charter parties on overnight trips that stay in motels average $449 of local spending per day. This averages $112 per person per day. These local trip-spending estimates do not include what is paid for in charter fees or tips.

It is also estimated that direct spending in Great Lakes coastal communities by charter fishing customers is $20.57 million per year, not counting charter fees. Charter customers on day trips spend approximately $10 million and those on overnight trips spend another $10 million. This does not include spending at home in preparation for the trip or spending on route to Great Lakes coastal communities where the boats are docked.

The direct annual economic impact of charter customer trip spending is $16.7 million in sales, $6.9 million in wages and salaries and $9.2 million in value added to the local economy, sustaining 331 jobs.

Table 60. Spending by Charter Boat Customers in Local Communities by Trip Segment[1]

	Trip Segment				Total
	Day Trip	Motel	Camp	Other Overnight	
Average spending ($ Per party day)	$197	$449	$218	$195	$253
Party days/nights (000's)	53,240	17,722	3,840	6,646	81,448
Total spending ($ Millions)	$10.47	$7.97	$0.84	$1.30	$20.57
Pct of party days	65%	22%	5%	8%	100%
Pct of spending	51%	39%	4%	6%	100%

[1]Does not include Charter fees or tips

Table 61. Average Trip Spending by Charter Boat Parties[1] in Local Communities

Spending Category	Spending per Party per Day				Spending per Person per Day			
	Day Trip	Motel	Camp	Other Overnight	Day Trip	Motel	Camp	Other Overnight
Motel, hotel cabin or B&B	$0.00	$160.00	$0.00	$0.00	$0.00	$40.00	$0.00	$0.00
Camping fees	$0.00	$0.00	$15.99	$0.00	$0.00	$0.00	$4.00	$0.00
Restaurants & bars	$90.00	$136.00	$90.00	$90.00	$22.50	$34.00	$22.50	$22.50
Groceries, take-out food/drinks	$45.00	$60.00	$45.00	$45.00	$11.25	$15.00	$11.25	$11.25
Gas & oil	$13.07	$16.17	$15.31	$12.45	$3.27	$4.04	$3.83	$3.11
Other vehicle expenses	$0.44	$1.57	$1.92	$0.23	$0.11	$0.39	$0.48	$0.06
Local transportation	$1.40	$6.70	$2.96	$0.67	$0.35	$1.67	$0.74	$0.17
Recreation/Entertainment	$18.00	$26.00	$18.00	$18.00	$4.50	$6.50	$4.50	$4.50
Souvenirs and other expenses	$28.81	$43.00	$28.81	$28.81	$7.20	$10.75	$7.20	$7.20
Total Local Spending	$196	$449	$217	$195	$49	$112	$54	$48

[1]Does not include Charter fees or tips

Table 62 Total Trip Spending by Great Lakes Charterboat Customers in Local Communities[1] ($000's)

Spending Category	Segment					
	Day Trip	Motel	Camp	Other Overnight	Total	Percent
Motel, hotel cabin or B&B	$0	$2,836	$0	$0	$2,836	14%
Camping fees	$0	$0	$61	$0	$61	0%
Restaurants & bars	$4,792	$2,410	$346	$598	$8,146	40%
Groceries, take-out food/drinks	$2,396	$1,063	$173	$299	$3,931	19%
Gas & oil	$696	$287	$59	$83	$1,124	5%
Other vehicle expenses	$23	$28	$7	$2	$60	0%
Local transportation	$75	$119	$11	$4	$209	1%
Recreation/Entertainment	$958	$461	$69	$120	$1,608	8%
Shopping	$1,534	$762	$111	$191	$2,598	13%
Total Spending	$10,473	$7,965	$837	$1,297	$20,573	100%

Table 63. Economic Impacts of Charter Boat Customer Spending on the Great Lakes states Economy[1]

Sector/Spending Category	Sales ($ 000's)	Jobs	Personal Income ($ 000's)	Value Added ($ 000's)
Motel, hotel cabin or B&B	$2,836	44.1	$1,237	$2,008
Camping fees	$61	0.4	$9	$21
Restaurants & bars	$8,146	206.0	$3,454	$3,895
Admissions & fees	$1,608	20.8	$599	$1,005
Gambling	-	-	-	-
Other vehicle expenses	$60	0.4	$12	$28
Local transportation	$209	6.1	$109	$122
Retail Trade	$2,446	46.3	$1,165	$1,523
Wholesale Trade	$543	3.5	$208	$365
Local Production of Goods	$860	3.6	$151	$227
Total Direct Effects	$16,769	331.3	$6,944	$9,195
Secondary Effects	$15,743	139.5	$5,309	$8,974
Total Effects	$ 32,512	470.8	$ 12,253	$ 18,169
Multiplier	1.94	1.4	1.76	1.98

[1]Excludes charter fees as this is covered in charterboat operations spending.

The sales multiplier for the Great Lakes states is 1.94. The direct and secondary impacts of charter fishing on Great Lakes communities are approximately $61 million in sales, $25 million in salaries and wages and $37 million in value added per year. The total annual employment impact of charter fishing in Great Lakes states is 1, 266 jobs.

Table 64. Economic Impacts of Great Lakes Charter Boats

Sector/Spending Category	Sales ($ Millions)	Jobs	Personal Income ($ Millions)	Value Added ($ Millions)
Direct Effects				
Operating Expenses	$ 15.40	657	$ 8.00	$ 12.58
Customer Spending	$ 16.77	331	$ 6.94	$ 9.20
Total Direct Effects	$ 32.17	988	$ 14.95	$ 21.78
Total Effects				
Operating Expenses	$ 28.58	795	$ 12.68	$ 19.40
Customer Spending	$ 32.51	471	$ 12.25	$ 18.17
Total Effects	$ 61.09	1,266	$ 24.93	$ 37.57

Table 65. Summary of Great Lakes Charter Boat Activity and Spending in the Great Lakes.

State	Licensed Boats	Charters	Operating Expenses ($ Millions)	Customer Trip Spending ($ Millions)	Total Spending ($ Millions)
Illinois/Indiana	64	2,962	$0.68	$0.65	$1.33
Michigan	468	27,715	$4.95	$6.11	$11.06
Minnesota	44	1,993	$0.46	$0.44	$0.90
New York	305	18,626	$3.22	$4.10	$7.32
Ohio	794	27,414	$8.39	$6.04	$14.43
Erie County (PA)	28	964	$0.30	$0.21	$0.51
Wisconsin	258	13,679	$2.73	$3.02	$5.75
Total	1,961	93,353	$20.72	$20.57	$41.29

8. Added Values of Recreational Harbors on the Great Lakes

Projects have been authorized and funds appropriated to construct and maintain the Lakes' shallow draft harbors. This history of authorizing the Corps to engage in construction and appropriating funds to carry out these authorizations has established the region's shallow draft harbors as federal navigation projects.

8.1 Harbor Depth and Function

According to the Corps, there are four types of harbors: commercial, recreational, harbors of refuge and subsistence harbors. (See insert.) From this perspective, harbors are seen from a standpoint of functionality and service, rather than depth. However, depth does play a role in functionality. Because shallow draft harbors cannot serve large commercial vessels that require deep draft, they can only be used for recreational purposes.

Types of Harbors

Commercial: must receive or ship a commodity tonnage
Recreational: anything not commercial
Harbors of Refuge: built to provide shelter from storms; some are deep, some are shallow
Subsistence: no roads; must rely on ships to bring in goods to community

For this reason, the term "recreational harbor" is often used interchangeably with shallow draft harbor. However, the two are not synonymous. All shallow draft harbors are recreational harbors, but not all recreational harbors are necessarily shallow draft harbors. The difference is primarily because some deep draft harbors once used for commerce no longer support commercial activities. These harbors are likely to benefit from their former commercial status to the extent that they will likely not require dredging for many years, if ever, to continue to serve recreational needs. In the Great Lakes, 11 federally authorized recreational harbors are also deep draft harbors: seven in Lakes Michigan, Superior and Huron (Detroit and Chicago Districts) and four in Lake Ontario and St. Lawrence River (Buffalo District). Table 66 identifies the deep draft, recreational harbors. The Corps defines shallow draft as any harbor that has a depth of less than 14 feet; deep draft is 14 feet or deeper.

Table 66. List of Deep Draft Recreational Harbors

Lake Superior	Lake Michigan	Lake Huron	Lake Ontario	St Lawrence River/Connecting Waterways
Grand Marais Harbor, MI	Kewaunee Harbor, WI	Cheboygan Harbor, MI	Great Sodus Bay Harbor, NY	Cape Vincent Harbor, NY
Grand Marais Harbor, MN	Oconto Harbor, WI		Little Sodus Bay Harbor, NY	Morristown Harbor, NY
Port Wing Harbor, WI	Sheboygan Harbor, WI			

8.2 Great Lakes Recreational Harbors

Eighty-seven recreational harbors have been federally authorized in the Great Lakes (see Table 71). Responsibility for construction and maintenance of recreational harbors and channels is shared among three Corps Districts: Chicago, Buffalo and Detroit. The Chicago District, which covers the Illinois and Indiana shores of Lake Michigan technically, has only one federally-authorized recreational harbor within its jurisdiction: Burns Waterway Small Boat Harbor. In practice, however, four of the eight harbors maintained by the Chicago District are primarily recreational harbors. Sixty-five federally authorized recreational harbors (58 harbors active) are the responsibility of the Detroit District, which covers Lakes Superior, Michigan and Huron (the shores along the states of Michigan, Minnesota and Wisconsin). The Buffalo District is responsible for 21 recreational (20 active) harbors along the shores of Lake Erie and Ontario (shores of states of Ohio, Pennsylvania and New York).

In practice, the actual number of operating recreational harbors around the Great Lakes is 78 because some were never built, have been deauthorized, or are classified as inactive. Four recreational harbors were authorized, but never built, including: Kelly's Island (Lake Erie); Black River/Alcona (Lake Huron); Cross Village (Lake Michigan); and Northport Harbor, (Lake Michigan). Another four recreational harbors have been deauthorized or are classified as inactive: Beaver Bay and Lutsen Harbors (Lake Superior) and St. Joseph River and Washington Island (Lake Michigan). Additionally, one recreational harbor—Little Lake, Michigan—is an inland harbor and not on the Great Lakes. Of these 78 active recreational harbors, 15 are found on Lake Superior, 22 on Lake Michigan, 14 on Lake Huron, 10 on Lake Erie, 8 on Lake Ontario, 2 on the St. Lawrence River and 7 on the connecting waterways.

Recreational Activities in Commercial Harbors
The Chicago Example

Although harbors may be classified as a commercial harbor, many may have a significant amount of recreational activity. The harbors in the Chicago region illustrate this phenomenon. The Chicago Harbor is officially a commercial harbor; however, the Chicago District no longer maintains it. The only commercial activity is barge traffic, and the majority is used for recreational boats. The Michigan City Harbor has been authorized as a commercial harbor because it was once a big fishing port. It is officially recognized as a commercial harbor, but is more commonly known as a recreational harbor. Although the Waukegan Harbor is classified as a commercial harbor, it contains two recreations marinas. This harbor needs environmental cleanup, but the chances of that happening are low, which may drive the change of the harbor's status to recreational.

Table 67. List of Active Recreational Harbors by Lake and Connecting Channel

Lake Superior	Lake Michigan	Lake Huron	Lake Erie	Lake Ontario	St Lawrence River/Connecting Waterways
Bayfield Harbor, WI	Burns Waterway Small Boat Harbor, IN	Au Sable Harbor, MI	Barcelona Harbor, NY	Great Sodus Bay Harbor, NY	Cape Vincent Harbor, NY
Big Bay Harbor, MI	Algoma Harbor, WI	Bayport Harbor, MI	Cattaraugus Creet Harbor, NY	Irondequoit Bay Harbor, NY	Morristown Harbor, NY
Black River Harbor, MI	Arcadia Harbor, MI	Caseville Harbor, MI	Cooley Canal Harbor, OH	Little Sodus Bay Harbor, NY	Mackinac Island Harbor, MI
Chippewa, Harbor, MI	Big Suamico Harbor, WI	Cheboygan Harbor, MI	Port Clinton Harbor, OH	Oak Orchard Harbor, NY	Mackinaw City Harbor, MI
Cornucopia Harbor, WI	Fox River, WI	Detour Harbor, MI	Rocky River Harbor, OH	Olcott Harbor, NY	Belle River, MI
Eagle Harbor, MI	Greilickville Harbo, MI	Hammond Bay Harbor, MI	Sturgeon Point Harbor, NY	Port Ontario Harbor, NY	Black River (Port Huron), MI
Grand Marais Harbor, MI	Kewalinee Harbor, WI	Harrisville Harbor, MI	Toussaint River, OH	Sackets Harbor, NY	Point River, MI
Grand Traverse Bay Harbor, MI	Leland Harbor, MI	Inland Route, MI	Vermilion Harbor, OH	Wilson Harbor, NY	Clinton River, MI
Knife River Harbor, MN	Les Cheneaux Island, MI	Lexington Harbor, MI	West Harbor, OH		Little River, NY
La Pointe Harbor, WI	Manistique Harbor, MI	Point Lookout Harbor, MI	Bolles Harbor, MI		
Lac La Belle, MI	New Buffalo Harbor, MI	Port Austin Harbor, MI			
Port Wing Harbor, W	Oconto Harbor, WI	Port Sanilac Harbor, MI			
Saxon Harbor, WI	Pensaukee Harbor, WI	Sebewaing River, MI			
Whitefish Point Harbor, MI	Pentiwater Harbor, WI	Tawas Bay Harbor, MI			
	Petoskey Harbor, MI				
	Portage Lake Harbor, MI				
	Saugatuck Harbor, MI				
	Sheboygan Harbor, WI				
	South Haven Harbor, MI				
	St. James Harbor, Beaver Island, MI				
	Washington Island, WI				
	White Lake Harbor, MI				

8.3 Recreational Harbors as Harbors of Refuge

Sixteen shallow draft recreational harbors on the Great Lakes are dually classified as harbors of refuge, thus serving the public safety function of providing recreational boaters protection during severe weather events. Without these maintained harbors, boating accidents and casualties would likely escalate as would the costs for U.S. Coast Guard search and rescue operations. Of the 78 active federally authorized recreational harbors in the Great Lakes managed by the Corps (including the inland lake, Little Lake Harbor, Mich.), 21 percent are also harbors of refuge, including seven on Lakes Superior, Michigan and Huron (five in the Detroit District; one in Chicago District) and three on Lake Erie and Ontario (Buffalo District).

Table 68. Great Lakes Recreational Harbors that are also Harbors of Refuge

Lake Superior	Lake Michigan	Lake Huron	Lake Erie	Lake Ontario
Big Bay Harbor, MI	Burns Waterway Small Boat Harbor, IN	Au Sable Harbor, MI	Barcelona Harbor, NY	Oak Orchard Harbor, NY
Black River Harbor, MI		Point Lookout Harbor, MI		Port Ontario Harbor, NY
Chippewa Harbor, MI		Port Austin Harbor, MI		
Eagle Harbor, MI		Port Sanilac Harbor, MI		
Grand Traverse By Harbor, MI		Hammond Bay Harbor, MI		
Lac La Belle, MI				
Whitefish Point Harbor, MI				

8.4 Recreational Harbors with U.S. Coast Guard Facilities

Five U.S. Coast Guard search and rescue stations are strategically located at shallow draft recreational harbors on the Great Lakes (four in Detroit District, one in Buffalo District.) These facilities are not only crucial to the public safety function performed by the Coast Guard, but also contribute economically to their host communities in goods and services purchased.

Table 69. Great Lakes Recreational Harbors Housing U.S. Coast Guard Search and Rescue Facilities

Lake Superior	Lake Michigan	Lake Huron	Lake Ontario
Bayfield Harbor, MI	Portage Lake Harbor, MI	Tawas Bay Harbor, MI	Great Sodus Bay Harbor, NY
	Sheboygan Harbor, WI		

8.5 Recreational Harbors with Ferry and Subsistence Services

Ten shallow draft recreational harbors on the Great Lakes are identified as locations for ferry services. As such, these harbors perform important transportation system functions in addition to their recreational benefits.

Table 70. Great Lakes Recreational Harbors with Ferry and Other Transportation Services

Lake Superior	Lake Michigan	Straits of Mackinac	Lake Huron	Lake Erie	St. Lawrence River
Bayfield Harbor, WI	Saugatuck Harbor, MI	Mackinac Island Harbor, MI	Cheboygan Harbor, MI	Port Clinton Harbor, OH	Morristown Harbor, NY
	St. James Harbor, Beaver Island, MI	Mackinaw City Harbor, MI	Detour Harbor, MI		
	Washington Island, WI (inactive)				

Five shallow draft recreational harbors on the Great Lakes are also classified as providing a subsistence role to island communities. Washington Island, St. James Harbor at Beaver Island and Mackinac Island are subsistence harbors. Although technically not subsistence harbors, Whitefish Point and Little Lake (the only federally-authorized inland recreational dredging project in the system) are both known areas for Native American fishing. The federal government has an important role in maintaining waterborne access to and from subsistence-based communities who depend on access to Great Lakes waters and/or fishing for their livelihood, particularly those that serve Native American communities and reservations where the federal government has had an historic role.

Table 71. Utilization of Great Lakes Recreational Harbors

Recreational Harbor	Lake Basin	District	Excursion/Ferry Services	Harbor of Refuge?	Coast Guard Facility?
BURNS WATERWAY SMALL BOAT HARBOR, IN	Michigan	Chicago	N	Y	N
BARCELONA HARBOR, NY	Erie	Buffalo	N	Y	N
CAPE VINCENT HARBOR, NY	St. Lawrence River	Buffalo	N	N	N
CATTARAUGUS CREEK HARBOR, NY	Erie	Buffalo	N	N	N
COOLEY CANAL HARBOR, OH	Erie	Buffalo	N	N	N
GREAT SODUS BAY HARBOR, NY	Ontario	Buffalo	N	N	Y
IRONDEQUOIT BAY HARBOR, NY	Ontario	Buffalo	N	N	N
KELLY'S ISLAND HARBOR, OH	Erie	Buffalo	N	N	N
LITTLE RIVER, NY	Niagara River	Buffalo	N	N	N
LITTLE SODUS BAY HARBOR, NY	Ontario	Buffalo	N	N	N
MORRISTOWN HARBOR	St. Lawrence River	Buffalo	Y	N	N
OAK ORCHARD HARBOR, NY	Ontario	Buffalo	N	Y	N
OLCOTT HARBOR, NY	Ontario	Buffalo	N	N	N
PORT CLINTON HARBOR, OH	Erie	Buffalo	Y	N	N
PORT ONTARIO HARBOR, NY	Ontario	Buffalo	N	Y	N
ROCKY RIVER HARBOR, OH	Erie	Buffalo	N	N	N
SACKETS HARBOR, NY	Ontario	Buffalo	N	N	N
STURGEON POINT HARBOR, NY	Erie	Buffalo	N	N	N
TOUSSAINT RIVER, OH	Erie	Buffalo	N	N	N
VERMILION HARBOR, OH	Erie	Buffalo	N	N	N
WEST HARBOR, OH	Erie	Buffalo	N	N	N
WILSON HARBOR, NY	Ontario	Buffalo	N	N	N
ALGOMA HARBOR, WI	Michigan	Detroit	N	N	N
ARCADIA HARBOR, MI	Michigan	Detroit	N	N	N
AU SABLE HARBOR, MI	Huron	Detroit	N	Y	N
BAYFIELD HARBOR, WI	Superior	Detroit	Y	N	Y
BAYPORT HARBOR, MI	Huron	Detroit	N	N	N
BEAVER BAY HARBOR, MN	Superior	Detroit	N	Y	N
BELLE RIVER, MI	St. Clair River	Detroit	N	N	N
BIG BAY HARBOR, MI	Superior	Detroit	N	Y	N
BIG SUAMICO HARBOR, WI	Michigan	Detroit	N	N	N
BLACK RIVER (PORT HURON), MI	St. Clair River	Detroit	N	N	N
BLACK RIVER HARBOR(GOGEBIC), MI	Superior	Detroit	N	Y	N
BLACK RIVER (ALCONA)		Detroit	N	N	N
BOLLES HARBOR, MI	Erie	Detroit	N	N	N
CASEVILLE HARBOR, MI	Huron	Detroit	N	N	N
CEDAR RIVER HARBOR MICH 1965 ACT	Michigan	Detroit	N	N	N
CHEBOYGAN HARBOR, MI	Huron	Detroit	Y	N	N
CHIPPEWA HARBOR, MI	Superior	Detroit	N	Y	N
CLINTON RIVER, MI	Lake St. Clair	Detroit	N	N	N
CORNUCOPIA HARBOR, WI	Superior	Detroit	N	N	N
CROSS VILILAGE HARBOR, MI	Michigan	Detroit	N	N	N

Recreational Harbor	Lake Basin	District	Excursion/Ferry Services	Harbor of Refuge?	Coast Guard Facility?
DETOUR HARBOR, MI	Huron	Detroit	Y	N	N
EAGLE HARBOR, MI	Superior	Detroit	N	Y	N
FOX RIVER, WI	Michigan	Detroit	N	N	N
GRAND MARAIS HARBOR, MI	Superior	Detroit	N	N	N
GRAND MARAIS HARBOR, MN	Superior	Detroit	N	N	N
GRAND TRAVERSE BAY HARBOR, MI	Superior	Detroit	N	Y	N
GREILICKVILLE HARBOR, MI (formerly Traverse City Harbor)	Michigan	Detroit	N	N	N
HAMMOND BAY HARBOR, MI	Huron	Detroit	N	Y	N
HARRISVILLE HARBOR, MI	Huron	Detroit	N	Y	N
INLAND ROUTE, MI	Huron	Detroit	N	N	N
KEWAUNEE HARBOR, WI	Michigan	Detroit	N	N	N
KNIFE RIVER HARBOR, MN	Superior	Detroit	N	N	N
LA POINTE HARBOR, WI	Superior	Detroit	N	N	N
LAC LA BELLE, MI	Superior	Detroit	N	Y	N
LELAND HARBOR, MI	Michigan	Detroit	N	N	N
LES CHENEAUX ISLAND, MI	Michigan	Detroit	N	N	N
LEXINGTON HARBOR, MI	Huron	Detroit	N	N	N
LITTLE LAKE HARBOR, MI	inland lake	Detroit	N	Y	N
LUTSEN HARBOR, MN	Superior	Detroit	N	Y	N
MACKINAC ISLAND HARBOR, MI	Straits of Mackinac	Detroit	Y	N	N
MACKINAW CITY HARBOR MI	Straits of Mackinac	Detroit	Y	N	N
MANISTIQUE HARBOR, MI	Michigan	Detroit	N	N	N
NEW BUFFALO HARBOR, MI	Michigan	Detroit	N	N	N
NORTHPORT HARBOR, WI	Michigan	Detroit	N	N	N
OCONTO HARBOR, WI	Michigan	Detroit	N	N	N
PENSAUKEE HARBOR, WI	Michigan	Detroit	N	N	N
PENTWATER HARBOR, MI	Michigan	Detroit	N	N	N
PETOSKEY HARBOR, MI	Michigan	Detroit	N	N	N
PINE RIVER, MI	St. Clair River	Detroit	N	N	N
POINT LOOKOUT HARBOR, MI	Huron	Detroit	N	Y	N
PORT AUSTIN HARBOR, MI	Huron	Detroit	N	Y	N
PORT SANILAC HARBOR, MI	Huron	Detroit	N	Y	N
PORT WING HARBOR, WI	Superior	Detroit	N	N	N
PORTAGE LAKE HARBOR, MI	Michigan	Detroit	N	N	Y
SAUGATUCK HARBOR, MI	Michigan	Detroit	Y	N	N
SAXON HARBOR, WI	Superior	Detroit	N	N	N
SEBEWAING RIVER, MI	Huron	Detroit	N	N	N
SHEBOYGAN HARBOR, WI	Michigan	Detroit	N	N	Y
SOUTH HAVEN HARBOR, MI	Michigan	Detroit	N	N	N
ST JAMES HARBOR, BEAVER ISLAND, MI	Michigan	Detroit	Y	N	N
ST JOSEPH RIVER, MI	Michigan	Detroit	N	N	N
TAWAS BAY HARBOR, MI	Huron	Detroit	N	N	Y
WASHINGTON ISLAND, WI (HARBORS AT)	Michigan	Detroit	Y	N	Y
WHITE LAKE HARBOR, MI	Michigan	Detroit	N	N	N
WHITEFISH POINT HARBOR, MI	Superior	Detroit	N	Y	N

9. Dredging Status of Great Lakes Shallow Draft Recreational Harbors

Federal funds are allocated based on performance outputs and national economic development benefits. This has resulted in prioritization of commercial harbors and navigation channels over recreational harbors, particularly those classified as shallow draft. From a Federal perspective, boat harbors serving primarily or solely recreational users do not produce high priority outputs, as do harbors and waterways that support high volumes of commercial traffic. Therefore, the President's budget continues to give priority to those harbors and waterway segments that support high volumes of commercial traffic and significant commercial fishing, subsistence and public transportation benefits.

9.1 USACE District Analysis: Chicago

As noted above, the Chicago District manages eight harbors: Burns Waterway Harbor, Burns Waterway Small Boat Harbor, Calumet Harbor and River, Chicago Harbor, Chicago River, Indiana Harbor, Michigan City Harbor and Waukegan Harbor. Half of the eight harbors are used primarily for recreational traffic. By classification, only one recreational harbor, the Burns Waterway Boat Small Harbor, exists under the District's jurisdiction. Additionally, it serves as a harbor of refuge.

Dredging needs for the harbors under the Chicago District's authority have for the most part been met with the exception of Indiana Harbor. Indiana Harbor, a commercial harbor, has not been dredged since 1972 due to concerns about contaminated sediments. The Burns Waterway Small Boat Harbor had been dredged in 2000, and was to be dredged again in 2006. The dredging frequency needs of the other three harbors that serve recreational activities, Michigan City Harbor, Waukegan Harbor and Chicago Harbor (no longer maintained by the Corps), have been met to date and there is no unmet need for the foreseeable future.

9.2 USACE District Analysis: Detroit

The Detroit Districts supports 65 federally authorized recreational harbors, but only 58 active recreational harbors. Data related to future (FY2005) funding and cubic yard shortfalls was only minimally available--for 6 of the 58 active recreational harbors (10 percent) as of 2004. Based on this data, the anticipated shortfall for these 6 harbors is 110,000 cubic yards, at an estimated cost of $1,727,000. Concerns by recreational boaters related to inadequate dredging depths have been recorded at least 6 of the 58 harbors. There is insufficient data to project unmet dredging needs in terms of funding and cubic yard shortfalls into the future.

9.3 USACE District Analysis: Buffalo

The Buffalo District supports 21 federally authorized recreational harbors, but only 20 active recreational harbors. (One recreational harbor, Kelly's Island Harbor in Ohio, is yet to be constructed.) Of the active recreational harbors, 77 percent of those located on Lake Erie have unmet dredging needs. Three harbors (Barcelona, Cattaraugus and Port Clinton) that require dredging on a 10-year basis have not been dredged as needed. Four of the six harbors with that require dredging on a cycle of every four years or less also have unmet dredging needs. Half—50 percent (4 of 8) of the recreational harbors located on Lake Ontario - also have unmet dredging needs. The dredging frequency needs of these harbors range from unknown, 4 to 5 years or 10

years. The Buffalo District estimates that, in FY05 alone there remains about 200,000 cubic yards of material that needs to be dredged to fully maintain shallow draft harbors, for which funding is not available. The cost to complete the unmet dredging needs in these 20 recreational harbors alone is estimated at $710,000.

9.4 Projected Dredging Needs

Obtaining data on projected cubic yardage shortfalls was particularly challenging, and data that was obtained by each of the Corps Districts projects was uneven. While data was available for the only recreational harbor in the Chicago District (Burns Harbor) data was much less available in the other two Great Lakes Districts. For instance, the Buffalo District identified 13 of its 20 active recreation harbors (65 percent) as having dredging shortfalls. However, data on cubic yard or funding shortfalls was only available for 8 of 13 recreational harbors. Data from the Detroit District on dredging shortfalls was only available for six of its 58 active recreational harbors (10%). Thus, the data for the Great Lakes at large were not sufficient to provide an accurate reflection of future needs for the region.

The collective data available to date (December, 2004) show that many recreational harbors are going longer periods of time between dredging, or are not being dredged at all, and the ability to use recreational harbors—for recreation as well as the other important federal services note above—may be compromised.

9.5 Environmental Compliance

Because the *John Glenn Great Lakes Basin Recreational Boating Study* is informational in nature, and does not recommend the construction of a project or structure, certain exemptions apply that would exclude this work from normally-required NEPA analysis. Pertaining to a July 24, 2006 *Memorandum for Record* from the Environmental Branch Chief at the Detroit District, the following was cited regarding this study:

> *Under ER 200-2-2, certain actions are excluded from NEPA documentation. ER-2-200 par 9 (c) states - " Planning and technical studies which do not contain recommendations for authorization or funding for construction, but may recommend further study... (are exempted from NEPA)" Since this is solely a study, no NEPA documentation or ROD/FONSI is required.*

Table 72. Dredging status of Great Lakes Recreational Harbors

Recreational Harbor	Current Status: active/inactive /deauthorized*	Dredging Frequency*	Last Dredged Date	Projected Dredging Date*	Frequency Needs Met*	FY05 Budget Shortfall*	FY05 Cubic Yards Shortfall*	FY05 Undredged*	Draft
BURNS WATERWAY SMALL BOAT HARBOR, IN	Active	?	2000	2006	?	?	?	?	Shallow
BARCELONA HARBOR, NY	Active	10 Yrs	1999	Not Scheduled	No	$370K	17,050	Yes	Shallow
CAPE VINCENT HARBOR, NY	Active	10 Yrs	Never	Not Scheduled	No	Unknown	Unknown	Unknown	Deep
CATTARAUGUS CREEK HARBOR, NY	Active	10 Yrs	Never	Not Scheduled	No*	$420K*	45,000	Yes	Shallow
COOLEY CANAL HARBOR, OH	Active	1-2 Yrs	2004	Not Scheduled	No	$0K	0	No	Shallow
GREAT SODUS BAY HARBOR, NY	Active	Unknown	2004	Not Scheduled	No	$0K	0	No	Deep
IRONDEQUOIT BAY HARBOR, NY	Active	5 yrs	2000	Not Scheduled	No	$370K	18,500	Yes	Shallow
KELLY'S ISLAND HARBOR, OH	Not Constructed	N/A	N/A	Not Scheduled	N/A	N/A	N/A	N/A	Shallow
LITTLE RIVER, NY	Active	10 Yrs	Never	Not Scheduled	No	$370K	15,000	Yes	Shallow
LITTLE SODUS BAY HARBOR, NY	Active	Unknown	1994	Not Scheduled	No	$370K	21,000	Yes	Deep
MORRISTOWN HARBOR	Active	10 Yrs	Never	Not Scheduled	Unknown	Unknown	Unknown	Unknown	Deep
OAK ORCHARD HARBOR, NY	Active	4 Yrs	2004	Not Scheduled	Yes	$0K	0	No	Shallow
OLCOTT HARBOR, NY	Active	10 Yrs	1997	Not Scheduled	Yes	$300K	8,000	Yes	Shallow
PORT CLINTON HARBOR, OH	Active	10 Yrs	Unknown	Not Scheduled	No	$370K	26,000	Yes	Shallow
PORT ONTARIO HARBOR, NY	Active	10 Yrs	Never	Not Scheduled	No	$370K	4,000	Yes	Shallow
ROCKY RIVER HARBOR, OH	Active	4 Yrs	2004	Not Scheduled	No	$0K	0	No	Shallow
SACKETS HARBOR, NY	Active	10 Yrs	Never	Not Scheduled	Yes	$0K	0	No	Shallow
STURGEON POINT HARBOR, NY	Active	1 yr	by Stakeholders*	Not Scheduled	Yes	$20K*	10,000	Yes	Shallow
TOUSSAINT RIVER, OH	Active	1 Yr	2004	Not Scheduled	No*	$320K	20,000	Yes	Shallow
VERMILION HARBOR, OH	Active	4 Yrs	2004	Not Scheduled	Yes	$0K	0	No	Shallow
WEST HARBOR, OH	Active	4 Yrs	2004	Not Scheduled	No	$0K	0	No	Shallow
WILSON HARBOR, NY	Active	10 Yrs	1997	Not Scheduled	Yes	$370K	12,500	Yes	Shallow

Recreational Harbor	Current Status: active/inactive /deauthorized*	Dredging Frequency*	Last Dredged Date	Projected Dredging Date*	Frequency Needs Met*	FY05 Budget Shortfall*	FY05 Cubic Yards Shortfall*	FY05 Undredged*	Draft
ALGOMA HARBOR, WI	Active	20 years	1993	2013					Shallow
ARCADIA HARBOR, MI	Active	one year	2004	2005	no	$75,000	5,000	yes	Shallow
AU SABLE HARBOR, MI	Active	10 years	2001	2011					Shallow
BAYFIELD HARBOR, WI	Active	41 years	1973	2014					Shallow
BAYPORT HARBOR, MI	Active	13 years	1992	2005	no	$1,000,000	30,000	yes	Shallow
BEAVER BAY HARBOR, MN	never built; deauthorized in '95								
BELLE RIVER, MI	Active	127 years	1889	2026					Shallow
BIG BAY HARBOR, MI	Active	5 years	2000	2005	no	$196,000	28,000	yes	Shallow
BIG SUAMICO HARBOR, WI	Active	9 years	2002	2011					Shallow
BLACK RIVER (PORT HURON), MI	Active	13 years	2003	2016					Shallow
BLACK RIVER HARBOR(GOGEBIC), MI	Active	6 years	2001	2007					Shallow
BLACK RIVER (ALCONA)	never built			none					Shallow
BOLLES HARBOR, MI	Active	5 years	2004	2009					Shallow
CASEVILLE HARBOR, MI	Active	5 years	2000	2005	no	$255,000	20,000	yes	Shallow
CEDAR RIVER HARBOR MICH 1965 ACT	Active	8 years	1999	2007					Shallow
CHEBOYGAN HARBOR, MI	Active	50 years	1976	2026					Deep
CHIPPEWA HARBOR, MI	naturally deep	100 years	1958	2058					Shallow
CLINTON RIVER, MI	Active	7 years	2000	2005					Shallow
CORNUCOPIA HARBOR, WI	Active	5 years	2001	2006					Shallow
CROSS VILILAGE HARBOR, MI	never built								
DETOUR HARBOR, MI	Active	27 years	1981	2008					Shallow
EAGLE HARBOR, MI	Active	39 years	1973	2012					Shallow
FOX RIVER, WI	Active	100 years	1925	2025					Shallow
GRAND MARAIS HARBOR, MI	Active	50 years	1973	2023					Deep
GRAND MARAIS HARBOR, MN	Active	50 years	1975	2025					Deep
GRAND TRAVERSE BAY HARBOR, MI	Active	4 years	2003	2007					Shallow
GREILICKVILLE HARBOR, MI (formerly Traverse City Harbor)	Active	75 years	1951	2026					Shallow
HAMMOND BAY HARBOR, MI	Active	15 years	1994	2009					Shallow

Recreational Harbor	Current Status: active/inactive /deauthorized*	Dredging Frequency*	Last Dredged Date	Projected Dredging Date*	Frequency Needs Met*	FY05 Budget Shortfall*	FY05 Cubic Yards Shortfall*	FY05 Undredged*	Draft
HARRISVILLE HARBOR, MI	Active	5 years	2000	2006					Shallow
INLAND ROUTE, MI	Active	14 years	1994	2008					Shallow
KEWAUNEE HARBOR, WI	Active	7 years	1999	2006					Deep
KNIFE RIVER HARBOR, MN	Active	7 years	1976	2016					Shallow
LA POINTE HARBOR, WI	Active	40 years	1992	2007					Shallow
LAC LA BELLE, MI	Active	15 years 12 years	1994	2006					Shallow
LELAND HARBOR, MI	Active	1 year	2004	2005	no	$90,000	15,000	yes	Shallow
LES CHENEAUX ISLAND, MI	Active	50 years	1971	2021					Shallow
LEXINGTON HARBOR, MI	Active	5 years	2003	2008					Shallow
LITTLE LAKE HARBOR, MI	Active	2 years	2004	2006					Shallow
LUTSEN HARBOR, MN	never built; deauthorized in '95								
MACKINAC ISLAND HARBOR, MI	No Fed Channel--subsistence harbor								No Channel
MACKINAW CITY HARBOR MI	Active	50 years	1968	2018					Shallow
MANISTIQUE HARBOR, MI	Active	50 years	1967	2017					Shallow
NEW BUFFALO HARBOR, MI	Active	5 years	2003	2008					Shallow
NORTHPORT HARBOR, WI	Not Constructed								
OCONTO HARBOR, WI	Active	15 years	1992	2007					Deep
PENSAUKEE HARBOR, WI	Active	17 years	1993	2010					Shallow
PENTWATER HARBOR, MI	Active	1year	2004	2005	no	$110,000	12,000	yes	Shallow
PETOSKEY HARBOR, MI	No Fed Channel								No Channel
PINE RIVER, MI	Active	113 years	1899	2012					Shallow
POINT LOOKOUT HARBOR, MI	Active	8 years	2001	2009					Shallow
PORT AUSTIN HARBOR, MI	Active	38 years	2004	2042					Shallow
PORT SANILAC HARBOR, MI	Active	7 years	2003	2010					Shallow
PORT WING HARBOR, WI	Active	4 years	2002	2006					Deep
PORTAGE LAKE HARBOR, MI	Active	9years	2002	2011					Shallow
SAUGATUCK HARBOR, MI	Active	3 years	2004	2007					Shallow
SAXON HARBOR, WI	Active	2 years	2001	2013					Shallow
SEBEWAING RIVER, MI	Active	10 years	1996	2006					Shallow

Recreational Harbor	Current Status: active/inactive /deauthorized*	Dredging Frequency*	Last Dredged Date	Projected Dredging Date*	Frequency Needs Met*	FY05 Budget Shortfall*	FY05 Cubic Yards Shortfall*	FY05 Undredged*	Draft
SHEBOYGAN HARBOR, WI	Not Active Dredging		1991						Deep
SOUTH HAVEN HARBOR, MI	Active	6 years	2002	2008					Shallow
ST JAMES HARBOR, BEAVER ISLAND, MI	subsistence harbor	75 years	1957	2032					Shallow
ST JOSEPH RIVER, MI	Inactive								Shallow
TAWAS BAY HARBOR, MI	Active		never	2014					Shallow
WASHINGTON ISLAND, WI (HARBORS AT)	Inactive--subsistence harbor	100 years	1939	2039					Shallow
WHITE LAKE HARBOR, MI	Active	8 years	2001	2009					Shallow
WHITEFISH POINT HARBOR, MI	Active	7 years	2000	2011					Shallow

References for Table 72

Class Change - Has harbor status changed from commercial to recreational? (yes/no)

Current status: Is the harbor project currently active/inactive/deauthorized?
Dredging Frequency - How often the harbor needs to be dredged to maintain the harbor's intended purpose

Projected Dredging Date - Based on funding availability and priorities, future date of dredging is estimated
Frequency Needs Met - Are the dredging needs of the harbor being met according to the desired frequency? (Yes/No)

FY05 Budget Shortfall - The difference between the funding needs to adequately dredge and the funds allocated for FY05 to dredge

FY05 Cubic Yards Shortfall - The amount of material that will go undredged due to FY05 budget shortfalls
FY05 Undredged - Is the harbor not dredged due to FY05 budget shortfalls (Yes/No)

Notes:
1. Only the Burns Waterway Small Boat Harbor is authorized as a recreational harbor.
2. *Dredging in Cattaraugus Creek Harbor and Toussaint require non-federal cost sharing. Dredging in Sturgeon Point is performed by the local cost-share partner with some Federal funding. Fed funding is cut starting in FY05.

9.6 Summary

Recreational boating within the Great Lakes is a very important sector of the economy within (and also external to) the Great Lakes basin. Although the number of recreational boaters registering their watercraft in Great Lakes states has slipped somewhat, the large numbers of recreational boaters and charter fishing clients who use the Great Lakes remains regionally economically- significant. In the case studies represented in this report, the average annual cost to maintain shallow draft harbors and channels on the Great Lakes compares favorably to the economic impacts gained by coastal communities through direct and indirect sales to recreational boaters, and in support of thousands of jobs.

As discussed in the text, some harbors and access channels have shoaled to the point of becoming marginally useable, and by only those vessels with minimal draw. Other harbors have seen suspensions of their maintenance dredging program. As water levels on the upper lakes remain below average after about three decades of above average levels, dredging becomes more critical in order to gain access to harbors and marinas. Longshore littoral drift (suspended sands and soils carried by currents) is a constant natural process that requires regular intervention to keep shoreline channels open. Many of these harbors, especially the larger ones with full-service marinas, are important to the local and regional economies, although, from a Federal perspective, boat harbors serving primarily or solely recreational users do not produce high priority outputs, as do harbors and waterways that support high volumes of commercial traffic. Therefore, the President's budget continues to give priority to those harbors and waterway segments that support high volumes of commercial traffic and significant commercial fishing, subsistence and public transportation benefits.

This report has been developed for informational purposes only, with no recommendations.

JAMES B. DAVIS
LTC, EN
Commanding

Date 3 Dec. 2008

10. Terms Used in this Study

Boat Day is the use of a boat under power or sail for any part of a day.

Craft Spending covers annual expenses associated with maintaining and storing the boat. This does not include new or used boat purchases, but includes equipment, repairs, insurance, slip and storage fees and other expenses.

Direct Effects: Direct effects are the changes in sales, income and jobs in those business or agencies that directly receive the boater spending.

Economic Impacts are the changes in sales, income, value added and jobs in the region associated with boating activity. A pure impact analysis would assess the net changes with versus without the given activity. In the absence of boating opportunities in the Great Lakes people would substitute other activities or travel to other locations for boating. Sales, income and jobs associated with boating would be shifted to other regions or sectors of the economy. The analysis reported here does not attempt to sort out these substitutions. Impact estimates therefore measure the size and importance of boating to the Great Lakes economy, not impacts in a "with versus without" sense.

Great Lakes Basin, as referenced in this report, refers to the watershed of the Great Lakes basin (the collective sub-watersheds of the five Great Lakes) which is indicated by the green filled area on the cover of this report.

Great Lakes Boating Activity includes boating use of the Great Lakes and connecting waters. Connecting waters include the St. Mary's River, St. Clair River, Lake St. Clair , Detroit River, Niagara River and St. Lawrence River as well as other lakes, rivers and streams that provide direct access to the Great Lakes.

Great Lakes Communities, as referenced in this report, are U.S. Great Lakes coastal cities or towns that have authorized harbors.

Great Lakes Economy, as referenced in this report, is the collective economy of the eight Great Lakes states, internal and external to the U.S. portion of the Great Lakes basin proper.

Great Lakes Region, as referenced in this report, refers to an indefinite area surrounding the physical Great Lakes; generally referring to Economic Impacts radiating outward from the Great Lakes.

Great Lakes States, as referenced in this report, refers to the eight Great Lakes states geographical extents *within* and *outside* of the Great Lakes basin.

Indirect Effects: Changes in sales, income and jobs from industries that supply goods and services to the business that sells directly to the visitors. For example, linen suppliers benefit from boater spending at lodging establishments.

Induced Effects: Changes in economic activity in the region resulting from household spending of income earned through a direct or indirect effect of the visitor spending. For example, motel

and linen supply employees live in the region and spend the income earned on housing, groceries, education, clothing and other goods and services.

Jobs: The number of jobs in the region supported by the boater spending. Job estimates are not full time equivalents, but include part time and seasonal positions. Four seasonal jobs for three months each counts as one job on an annual basis, whether part time or full time.

Margining of Retail Purchases: Boater purchases of goods (gas, groceries, equipment, clothing, etc.) are handled in input-output models by assigning retail margins to the retail trade sector, wholesale margins to wholesale trade sector and the remaining producer price to the appropriate manufacturing sector. Impacts of the manufacturers share of these purchases are only included if the good is made within the region.

Personal Income: Wage and salary income, sole proprietor's income and employee benefits.

Registered Boats: For Pennsylvania, only craft registered in Erie County, PA are included.

Sales: Sales of firms within the region to boaters.

Secondary Economic Impacts: Impacts that occur incidentally to the primary impacts. The primary impact of boater spending in boat shops, gas stations, grocery stores, tourist shops, hotels, restaurants, etc., increases the ability of these establishments and their employees to increase spending. Their increased spending increases the spending ability of others, and so on. Data and time were insufficient to determine the multiplier for boater spending.

Total Effects: Sum of direct, indirect and induced effects. Direct effects accrue largely to boating and tourism-related business in the area. Indirect effects accrue to a broader set of economic sectors that serve these firms. Induced effects are distributed widely across a variety of economic sectors.

Trip Spending includes all expenses made while on boating trips, e.g. auto and boat fuel, food, lodging, shopping, etc.

Value Added: Personal income plus rents and profits and indirect business taxes. As the name implies, it is the value added by the region to the final good or service being produced. It can also be defined as the final price of the good or service minus the costs of all of the non-labor inputs to production. Value added is the best measure of the contribution of an industry or region to gross state or national product.

11. References

Kuehn, D. and C. Dawson. 1996. *New York's 1994 Great Lakes Charter Fishing Industry*. Stony Brook, NY: New York Sea Grant Institute.

Lichtkoppler, F. R., C. Pistis, and D. Kuehn. 2003. *The Great Lakes Charter Fishing Industry in 2002.* (OHSU-TS-039) Great Lakes Sea Grant Network.

Lichtkoppler, F. R., and D. Kuehn. 2003. *New York's Great Lakes Charter Fishing Industry in 2002.* (OHSU-TS-035) Great Lakes Sea Grant Network.

Lichtkoppler, F. R. 2003a. *Pennsylvania's Great Lakes Charter Fishing Industry in 2002*. (OHSU-TS-037) Great Lakes Sea Grant Network.

Lichtkoppler, F. R. 2003b. *Ohio's Great Lakes Charter Fishing Industry in 2002*. (OHSU-TS-036) Great Lakes Sea Grant Network.

Lichtkoppler, F. R. 2003c. *Illinois-Indiana's Great Lakes Charter Fishing Industry in 2002.* (OHSU-TS-032) Great Lakes Sea Grant Network.

Lichtkoppler, F. R. 2003d. *Wisconsin's Great Lakes Charter Fishing Industry in 2002*. (OHSU-TS-038) Great Lakes Sea Grant Network.

Lichtkoppler, F. R. 2003e. *Minnesota's Great Lakes Charter Fishing Industry in 2002.* (OHSU-TS-034) Great Lakes Sea Grant Network.

Lichtkoppler, F. 1996. *Ohio's Great Lake Charter Fishing Industry in 199*4. Columbus, OH: Ohio Sea Grant College Program.

Lichtkoppler, F. 1996. *Minnesota's Lake Superior Charter Fishing Industry in 1994.* Columbus, OH: Ohio Sea Grant College Program.

Mahoney, Edward, Daniel J. Stynes, Tzu-Ching Chang and Tyrone McCelleis, 2003. *The Economic Importance of Michigan's Recreational Boating Industry.* East Lansing, MI: Recreational Marine Research Center, Michigan State University.

New York State Department of Environmental Conservation, 2002. *Listing of Marinas, Lake Ontario and St. Lawrence River*. Oswego, NY: New York Sea Grant, Empire State Marine Trades Association.

Pistis, C., and F. R. Lichtkoppler. 2003. *Michigan's Great Lakes Charter Fishing Industry in 2002*. (OHSU-TS-033) Great Lakes Sea Grant Network.

Pistis, C., K. Lagerberg, and A. Nevala. 1996. *1994 Survey of the Michigan Charter Fishing Industry.* Ann Arbor, MI: Michigan Sea Grant College Program.

Stynes, Daniel J., Tsung Chiung Wu, and Edward M. Mahoney, 1998. *1994 Michigan Boating Survey. Clean Vessel Act/Michigan Boating Study, 1994-95, Report II.* East Lansing, MI: Michigan Agricultural Experiment Station, Michigan State University.

United States Congress. *Federal Boating Act of 1958.* Sept. 2, 1958. P.L. 85-911, 72 Stat. 1754, as amended.

United States Congress, *The Water Resources Development Act of 1999,* August 17, 1999. P.L. 106-53, 113 Stat. 269.